THE BUSINESS QUARTERLY

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Number 4

WINTER
1953

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Trans-Era's Share of Production, —Barrels per day		700
Drilling Rigs in Operation —10 in the United States; 3 in Western Canada		13
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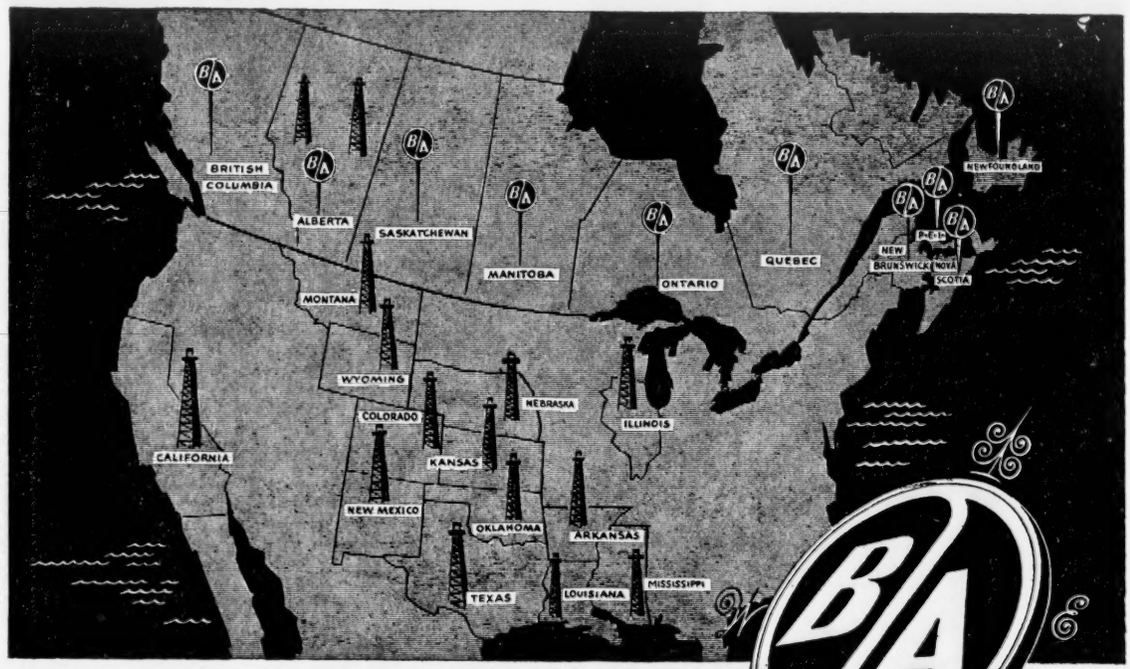

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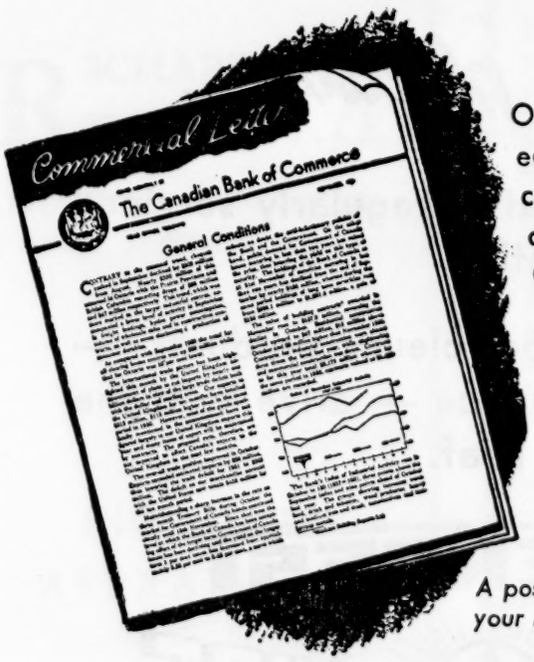

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1952

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About Our Authors . . .

Mrs. W. R. Walton, Jr. is well known for her athletic accomplishments, charitable activities, and community leadership. She was Honorary Treasurer of the IODE for seven years and is now one of its National Vice Presidents. She is National President of the Canadian Association of Consumers, and during the war, served in a voluntary capacity as Chairman of the Speaker's panel of the Consumer Branch of the WPTB, of the Women's Division of the Toronto Victory Loan Committees, and of the War Savings Stamp Committees. She received her B.A. and M.A. degrees in Economics from the University of Saskatchewan. Mrs. Walton has contributed to our journal in the past, and we welcome her article on the work of the CAC which appears in this issue.

Our advertising series continues with an article entitled "Magazine Readership Studies, by **Duncan MacInnes,** Manager, Media Department, McCann-Erickson Inc., Toronto. Previously, Mr. MacInnes was Secretary and Director of Research, Canadian Daily Newspapers Association, and Manager of The Magazine Advertising Bureau of Canada. His position as Secretary of the Magazine Research Group of Canada, which dealt with *The Audience Study of 11 Magazines* (1952) further qualifies him as an authority on readership. At present President of the Toronto Chapter, American Marketing Association, Mr. MacInnes is the author of many articles on business and technical subjects.

One of the new members of *The Quarterly's* Editorial Board, **J. L. Wild** has prepared the article on "Employee Journals". Professor Wild, a graduate of the University of Western Ontario, is now head of the Department of Journalism at University College, U.W.O., and is also the Western Ontario correspondent for Time, Inc. He has previously been associated with

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Communications . . .

Government Price Support Policy

Dear Sir:

Professor Gordon, in his article, "Government Price Support Policy", which appeared in the 1952 Fall Issue, raises a number of important issues with respect to price supports for farm products.

Apparently he considers farm price support policy as a policy of social security for farmers. He suggests that price supports are a clumsy tool for providing social security for farmers and points out that it is very expensive because the large scale farmer receives a great deal more from the public purse than the small scale farmer.

Farmers receive their rewards as net income after all expenses are paid. They do not receive a wage. As such they are businessmen. A large scale farmer would be bankrupt if he received a social security payment only as large as a small scale farmer, which is what Professor Gordon implies when he says "direct benefits would be received by the individuals experiencing the difficulty". If so-called social security payments were large enough to prevent a large scale farmer from going bankrupt, his plan would be just as expensive as present price support policy. What is even more important is that the administration of his suggested policy would involve the Government in a hopeless maze of red tape. Moreover as such payments would be looked upon by some as relief payments, I doubt if farmers would support it. Price support programmes do aim to give farmers promise of minimum security. But since the two other major groups in our society, industry and labour, enjoy a measure of security as great if not greater than that enjoyed by farmers under a price support policy, farm people are likely to stand solidly behind such a policy with all its faults until some better measure is found to achieve the same objectives.

A minimum measure of security cannot be provided for farm people by the same methods as used for industry or labour. Professor Gordon looks upon a price support policy as social security. If it is, then Canada's protective tariff is social security for industry. And when you think of the amount our relatively high protective tariffs are costing the people of Canada—through a form of taxation or "support price" if you like — the 12 cents per capita per year our farm price supports have amounted to since the programme was introduced six years ago is in reality "pin money" by comparison.

Likewise, add together the state cost of administering the unemployment insurance program, $20.3 million in 1949-50, and the direct Government grants for unemployment insurance—amounting to $21.1 million in the same year—and again we have a social security measure for labour, the cost of which far exceeds the small amount —approximately $10 million—so far spent on farm price supports. So the non-agricultural section of our population may enjoy themselves criticizing the success and efficiency of farm price supports as a minimum security measure for people on the land, but when they do they must, in all honesty, admit that they are looking down at agriculture from a higher level of social security—and moreover a level which is costing Mr. and Mrs. John Citizen far more than are price supports for primary producers.

H. H. HANNAM
President and Managing Director
The Canadian Federation of Agriculture
Ottawa, Ontario.

About Our Authors . . .

The London Free Press, three British Newspapers (*The Times, The Daily Mirror,* and Kemsley Newspapers), and *Fortune.*

James M. White, who discusses the methods of and reasons for controlling reports, studied engineering at Johns Hopkins University. He received his M. B. A. from New York University, and also is a Certified Public Accountant. At present on the faculty of McGill University (Mechanical Engineering Department), Professor White says, "My main interest is management research, and this is my first attempt at writing." We hope to hear from him again!

Because he has been closely connected with time study since 1927, **Ralph Presgrave's** comments concerning basic motion time study are indeed interesting. Mr. Presgrave is a lecturer in Time Study at the University of Toronto (Engineering). He received his Bachelor of Applied Science (Chemistry) degree from the University of Toronto and has since been associated with the textile industry in Canada, the United States and Ireland. He is Vice President in charge of Production and Personnel of York Knitting Mills, and is one of the founders of J. D. Woods and Gordon, Limited.

The Lighting Institute of the Lamp Division, Canadian General Electric Co. Ltd., is partially designed to help those seeking knowledge of lamp and lighting applications. Its manager, **J. W. Bateman,** has prepared an informative discussion concerning lighting in industry with the hope that it will prove helpful to *Quarterly* readers. Mr. Bateman received his B.A.Sc. (Electrical Engineering) from the University of Toronto. Following graduation, he received C.G.E.'s "Test" training and later joined the newly-formed Lighting Service Department (now the Institute), of which he became Manager in 1930.

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Poll of Canadian Executive Opinion

Late in December, the third Poll of Canadian Executive Opinion was undertaken in an effort to study the general business outlook for 1953 and to relate it to the anticipated patterns of individual firms and sectors of the economy. The following is a brief statement of the findings:

Businessmen anticipated generally steady to higher industrial production in 1953; most looked forward to a levelling off of industrial employment, yet expected an increase in hourly wages. Many think the rise in the cost of living has been arrested. In line with the above, they feel that there will be fewer strikes and lockouts in 1953. Opinions concerning common stock price movements vary considerably, but a majority agree that stock prices will rise or remain the same.

Panel members are relatively optimistic about their own firms' activities. In general, they expect increased physical volume of production or activity and company earnings. To meet greater demand, they plan to order more raw materials (at prices close to those of 1952). Following the general business outlook, most plan to increase wages, but believe that the size of their labour force will remain about the same. A fairly large percentage expect the prices of the products and/or services their firms offer will not change.

The results of each Poll are mailed to *Quarterly* readers. We hope you find them interesting and helpful.

New Developments in Timestudy

Ralph Presgrave

In this article, Mr. Presgrave, who is Vice-President of J. D. Woods & Gordon, traces the development of current techniques in timestudy, compares and contrasts individual methods, and points out the advantages and drawbacks of such programmes when they are applied in the manufacturing plant. Timestudy's effect on human relations, productivity, and costs should concern all alert production executives and command the attention of other readers.

The term timestudy is almost as common in industry as is the term accounting. No longer esoteric, it is encountered in industrial conversation at all levels and is, above all, familiar to millions of union members. In most newspapers, advertisements for timestudy men appear almost daily. On the other hand, few dictionaries carry a definition even though the word is passing from the two-word stage (with capitals) through the hyphenated period and is now frequently spelled as one word. It is probable that for some readers a definition may be necessary since the term is not entirely self-explanatory.

The Specialized Nature of Timestudy

It refers to the general procedure (of which there are many variants) of arriving at a standard time for performing a specific piece of work under prescribed conditions. This obviously raises a host of questions of a technical nature. These are supremely dull for the layman and probably only of interest to those directly concerned with timestudy. We shall not touch on them here except as they relate to certain points that will be raised.

Indeed, one may well speculate as to the need for management line (and even certain staff) to concern themselves with any details of timestudy since it is primarily a special staff function and one with which the manager requires only a nodding acquaintance, usually being content to leave its workings to an accredited member of a profession whose methods have become reasonably well standardized and universally accepted.

In the case of accounting, the manager is concerned only with the final results, and in a sense this is true with timestudy, or at least is true when the manager has complete confidence in the staff specialist in charge of timestudy. This confidence he can gain only by years of close association and observation of both methods and results. Probably the key to the divergence from the parallel is that the timestudy expert is not yet professionally accredited, although progress is being made in that direction.

The Human Aspects of Time Study

In addition to this, it is also a fact that timestudy procedures, well before the final net results are apparent in costs and productivity, have an immediate bearing on human relations in the plant. How the timestudy man conducts himself and how he applies his techniques are matters of constant concern to all who have supervisory responsibilities. In a real sense, the timestudy man virtually dictates what a man must do through all his working hours and how much money he will take home. As a result, he has a strong influence on how a man feels towards his employer, and on what his immediate standard of living is to be. This point requires no elaboration. Anything that bears on these touchy matters is obviously of primary importance to all levels of management.

Effect on Costs

Apart from the personal aspects of timestudy there is another, which again diverges from our parallel with accounting. Accounting is the recording of history, and while it is true that the great value of accounting is that it records the past in such a fashion as to permit us to deal more satisfactorily with the future, nevertheless its function is to *report* on costs, while timestudy in reality is a strong factor in *creating* those costs.

This is not intended as a derogation of accounting—far from it. In a sense the accountant does what he has to do better than the timestudy man performs his function. Also it is still possible for a plant to get along without timestudy—but not without accounting. Possibly this comparison is not entirely valid, and in any event, it is an oversimplification of a lively and complex subject. To revert to our theme, it is clear that an operation that bears so pointedly on human relations and is a predominant element in the task of obtaining a just return for the increasing labour dollar cannot be ignored by management either as to technique or as to final results.

Acceptance by Employers and Unions

This is all the more true now that timestudy has become so universally used. Through the twenties and well into the thirties a few manu-

facturers took it on and employed it fully and successfully. A few more went into it gingerly, and some dropped it because of the opposition of labour. Many more did not understand it and shied away from it.

Over the past ten or fifteen years and especially since the war the spread of timestudy in North America and other countries has been phenomenal. It is used in almost all manufacturing plants—both large and small. It is accepted by most unions, although sometimes with reservations. Almost no union opposes it entirely, and several of the larger unions go so far as to have industrial engineering departments with timestudy experts on their staffs. They also conduct classes and appreciation courses for stewards and organizers.

It is true that this is more for policing purposes than anything else, and that as a consequence the degree of objectivity leaves something to be desired. Since the unions are and must be essentially political in nature, this is not surprising, nor is it necessarily undesirable. In fact it is safe to say that the unions' critical interest has led to self-examination and an improvement in techniques. Moreover, in the process of criticism the principle itself appears to have been accepted as part of the growing belief of unions that technological improvement must be supported if industry and the economy (and consequently the unions) are to survive.

The advent of timestudy is a natural outgrowth of the times in which we live. In the so-called engineering age the precise analytical approach to a problem is becoming more and more prevalent. In keeping with this timestudy is an effort to replace the unreliable estimates of foremen and the doubtful records of past performance with a system that comes as close to actual measurement as is humanly possible.

Degree of Reliability

The usual procedure has been to time an operation by means of a stop-watch of special design, to estimate the speed at which the operator was working, and from a combination of these two, produce a number which purports to be the standard or normal time for the job.

There have been many systems of varying degrees of reliability, but in the main it is safe to say that, bit by bit, accuracy and consistency have improved. A great deal of patient and intelligent work has been done, with the result that there has been a growing confidence in the technique in spite of its occasional lapses. In fact, one might almost say that there has been over-confidence. The results in terms of savings in costs, increasing output, and higher earnings have often been so spectacular that many companies, eager to get in on a good thing, have

undertaken it with inadequate preparation. Also many clerks have become timestudy men without enough training or experience. There has even been a certain amount of racketeering.

Even so, the good results have more than offset the errors of incompetence and lack of understanding, and timestudy can be said to have arrived at least in a rough and ready sort of way.

Two Major Problems

The arrival, however, has not been without its difficulties, and it is now apparent that in the future we shall need further refinements in accuracy in the individual study and in consistency among related rates. To anyone who has had any experience at all with the techniques of modern time study, it is quite obvious that it is at times a difficult and complicated art and that it has its own peculiar problems. Some of these are highly technical—too technical to be discussed in an article such as this. However, there are two fundamental questions with which every timestudy man is eternally confronted. They are apparent to any layman because they relate directly to the productivity of the operator himself.

The timestudy man has to ask himself these two questions on every single job that he tackles. If he answers them incorrectly, he is headed for trouble and there is no gainsaying that the timestudy man's trouble is also the manager's trouble. It may also be the employee's trouble or the union's trouble.

The two questions are simple and obvious: (1) Is the job being done correctly? That is to say, is it now being done in the best possible way and in exactly the way it will be done after the rate has been set? (2) How fast is the operator going while he is being studied? The answers may not be easy, especially that to the first question. The second question is quite simple if the first is answered satisfactorily. If these two questions can be answered with complete assurance, the remaining problems, tricky as they may be from a technical viewpoint, present no real worries.

In fact, although some would disagree, I would say that the battle is about won if question number one can be settled. I rather suspect that the layman might feel that the second question is the difficult one. It all depends upon what we mean by "how fast". Do we mean "How many pieces are produced in a given time?" or do we mean "How rapid are the man's movements?" How much a man produces in a given time under fixed conditions depends wholly on two factors: (1) What exactly does he do? (2) How fast does he do it? These, obviously, are our two basic questions restated a little differently and perhaps more fundamentally.

The first one, in one form or another, is a constant problem to the timestudy man and indeed to foremen, superintendents, and everyone else. It is the major cause of inconsistent rates. Very often it is the one that cannot be met at the time a rate is set. Theoretically, the timestudy man should know exactly how a job should be done, or if he doesn't, the foreman should be able to tell him. In a general way this is the case, but the real problem is focussed on single finger movements, minor pauses, or eye-fixations, and so on. Some of these are so minute that they could not be caught by the stop-watch or even by the standard movie camera. Few foremen and not enough timestudy men are aware of their significance.

This continues to be the basic problem of the timestudy man and, although he may not realize it, of the manager. Failure to meet it adequately means the gradual development of inconsistent and, in the main, loose rates. These in turn lead to soldiering, to disgruntled operators, to wage disputes, and eventually to arbitration of a type that is usually unsatisfactory and inconclusive. The phenomenon in question has come to be known as the "creeping change".

Thus anything which might lead to greater precision in the standards set by the timestudy department is of supreme importance to all concerned. Quite naturally this is the goal of all timestudy men who, if they are worth their salt, are constantly striving to improve and refine their methods.

The Development of Timestudy Techniques

This is the situation that accounts for the fact that an article appearing in *Fortune* for October 1949 was greeted with an intense interest that has increased over the intervening months. It was called "Timing a Fair Day's Work", and it deals with what purports to be a new technique for timestudy.

In a sense it is new, but it can hardly be regarded as unique, for there are several other preceding or contemporary schemes which achieve the same ends in a somewhat similar fashion.

Underlying them all is an idea that is as old as timestudy itself. In fact, it was outlined some sixty years ago by Frederick W. Taylor, the genius who is justly regarded as the originator of scientific management. He, and many others since, have been taken with the reasonably obvious notion that all manual operations are compounded of simple and indivisible movements of the fingers, arms, and other body members. If we could isolate and catalogue these motions and could assign time values to them, it should, at least in theory, be possible to establish tables

and charts from which we should in turn be able to describe a manual procedure in terms of its components. The sum of the times for these motions would form the standard or normal time for the operation in question.

Taylor was not able to bring this theory to fruition, but he laid the philosophic ground work unerringly and inspired many of his followers to continue working on the technique, in spite of the obvious difficulties of recognition and isolation of small movements and of finding the true time for each. The task seems almost insuperable, but it has been tackled by several highly competent technicians, each of whom has moved a little closer to the goal, which is the establishment of time standards for virtually any manual job without resort to the stop-watch and the estimate of operator speed.

The first to make a practical success of the technique was A. B. Segur, who almost forty years ago developed M.T.A. (Motion Time Analysis), a scheme which still enjoys a degree of success in industry. However, Segur's methods were held incommunicado, and his clients were sworn to secrecy. As a result, his plan did not enjoy wide acceptance and naturally came somewhat under suspicion. Also, it is complicated and minutely detailed.

Another industrial engineer, Harold Engstrom, developed a somewhat restricted but successful plan in connection with his work at the General Electric Company (U.S.). At about the same time Joseph Quick, an industrial engineer at R.C.A. Victor, published a system of body-member standards which he called Work Factor. This system is devised with some intelligence and has achieved a degree of acceptance in the United States and in Canada.

Others, by dint of study of existing data and theory, and by conducting experiments of their own, have developed other methods. They have all been somewhat overshadowed by a relative newcomer in the field. This is the one referred to in the *Fortune* article. It is called M.T.M. (Methods Time Measurement), and was developed by members of a consulting firm. Its originators, Messrs. Maynard, Stegemuerton, and Schwab, have published the only book that really comes to grips with the subject of basic motion analysis and timing. They have established many successful applications in industry and, on the strength of the attention stimulated by *Fortune* and other publications, have enjoyed wide and lively publicity.

The Drawbacks of M.T.M.

Actually, in spite of its deserved successes, M.T.M. is in some danger because of the enthusiasm of its recent converts and the consequent sweeping claims that are made for it in some quarters. In spite of the

warnings of its originators, it is a widespread impression that the stop-watch is now obsolete and that a standard for any operation can be produced synthetically at the drop of a hat from charts or tables. To some extent this is true. For most fully manual jobs it is possible, if not always feasible, to set production standards from merely watching the operation, measuring distances, and reducing the motion pattern to its simplest form without using a stop-watch or applying the factor derived from an estimate of operator rate of speed. In many cases it is possible for the timestudy expert to set standards from blue prints, samples, prototypes, etc. without even entering the plant to view the operations.

On the other hand, jobs such as are common in textiles, with components of machine time or in which a battery of machines is operated, still require a great deal of study, timing, and the application of probability formulae. Also there remain certain gaps in the motion data and certain irregularities of description which tend to restrict accuracy in certain types of motion or at the limits of the near and far distance range of other motions.

The latter largely point out the necessity for improving and extending the experimental procedures of actual timing of brief movements and may be expected to clear up as techniques advance.

More serious than these are the problems posed by the rather obvious requirements: (1) The single motions must be capable of separation from all others without overlapping. Each must be an entity. (2) The motion must be amenable to a description so specific that there can be no room for error in selecting from a table of times. (3) The sum of the standard times must be the correct overall time for the job. This clearly relates to (1) above. These problems must be solved if the process is to be fully transferable from one engineer to another, so that the vagaries of individual observers are reduced to an absolute minimum.

New Refinements

Needless to say, this situation is uppermost in the minds of those who are working on this new method. Among them—and probably the only group in Canada who are working on a systematic basis—are members of the consulting firm of J. D. Woods & Gordon who have devoted several years to detailed experimentation and critical examination of theories and results.

They have produced a system called Basic Motion Timestudy (B.M.T.) which they believe comes closer to perfection than any other system. Their methods have been well proven in actual production operations in many types of industry. Experiments continue, of course, but

the basic theories continue to be justified in practice. One card, no bigger than your driver's license, would hold all the data necessary for setting standards on most of the manual operations likely to be encountered.

B.M.T. has other values apart from rate setting without a watch. Consistency among standards is tremendously improved. The time taken to set standards is shortened considerably, and since, as we have noted, standards can be set in advance of the operation, the operator knows where he stands before starting to work on a new operation. To those who are familiar with the problems of temporary standards, retroactive standards, allowances, standby rates for learning, etc., this will be most significant. B.M.T. facilitates motion-study and the simplification of operations as no other technique has done. It is surprisingly acceptable to unions and employees, who appear to understand it more readily than they do the various stop-watch methods. Once accepted, it narrows the area of dispute as to work load and job assignments and should go far towards eliminating one of the more difficult areas of arbitration. Still another value is the use of the component data in training new operators and in retraining old operators in the most effective methods of working.

Future Steps Towards Universal Use

All serious students of the so-called synthetic methods are aware of the fact that in spite of the success of practical applications, there is still a great deal to learn. Research continues, and it may be assumed that the now small marginal areas will gradually be filled in and the techniques will become universally used for all manual work standards.

Herein lies another danger. Some may feel that the possession of the tables should enable them to set standards. Certainly with a few weeks of preliminary training and explanation, this would be the case, and confidence and greater accuracy would develop out of experience. Nevertheless such a system is not automatic. It demands a high degree of intelligence and imagination from those who are to use it with continuing success. However, employed carefully and consistently, new techniques in timestudy should lead to more beneficial management-employee relations and more efficient productivity.

Employee Journals

J. L. Wild

Every businessman is today concerned in some degree with the problem of establishing and maintaining effective communication within his organization. Professor Wild, Head of the Department of Journalism at the University of Western Ontario, discusses the use of employee journals to help meet this need, with special emphasis on making the journal effective.

TIME was in what we are pleased to call "the good old days", when the "big boss" would take a mid-morning stroll through the plant. He would chat with the men, ask them about their wives and children, tell them about the big order the firm's star salesman had just secured, and talk about the new machine for the mill. At noon the men would gather in some uncluttered corner of the plant, open their lunch pails, and themselves talk about that big order, the new machine, or any other shop news. Here was simple, direct, and personal communication, the most effective kind.

The size and complexity of many a modern business makes this kind of direct communication difficult at best and in most cases impossible. If we accept the thesis that the extra-official exchange of ideas between management and employees and amongst the employees themselves is desirable, and there are those who hold that it is essential, some medium of mass communication must be substituted in the large industrial organization of today for the easy personal relations in smaller businesses.

The House Organ — A Medium for Communication

Management has found that medium in the employee publication, the internal house organ. Since the war, house organs have multiplied three-fold. *Printer's Ink Directory of House Organs* lists nearly six thousand in the United States and Canada. More than two hundred Canadian companies have an employee publication; some have as many as five, not including the external house organ, published primarily for dealers, customers, and stockholders.

Common Drawbacks of Employee Journals

Although management long since has discovered this implement for mass communication within its own walls, in many cases it has not

learned how to use it effectively. In the main this arises out of confusion over the purpose of the plant paper. Too often the employee publication is not used as a means of true communication, but rather to "sell" the company to the employees, to build employee morale, and to increase production. These worthy objectives will show up as side-products of a well-edited and informative plant paper, but when directly plotted for without regard for the principles of good journalism, they give rise to the kind of house organ which is all too common today. The end product will be either a slick package of the obvious wrapped in the cellophane of platitude and tied with a red ribbon of clichés, or a mass of turgidity, depending on how much professional assistance the budget will allow.

Preaching to employees about the evils of absenteeism, boondoggling, and waste, harping about the generosity of the firm, over-playing the one-big-happy-family tune are signs of an editor who is working too hard at "selling" the company. Too often in such situations the "president's message" reads like a ponderous sermon and has the same effect. It is naive to think that this heavy-handed editorial treatment can have any telling effect on the readers. This arises out of the difference between the professional and non-professional approach to the content of any journal, whether it be daily newspaper or house organ. The professional editor has learned that, in the main, he must print the news that the reader wants and needs. The non-professional too often tries to print what he thinks the reader ought to want and need. It is this non-professional attitude that leads to a situation in which the house organ becomes merely a soap-box for the executives.

If the employee publication is to achieve its main purpose, to serve as a channel of communication between management and the employee and among the employees themselves, the principles of good professional journalism must be followed. This means that the burden of the content of the publication must be news, legitimate news.

The Fundamentals of News

How do the general principles of news evaluation apply to the specialized field of the employee publication?

The search for a neat definition of "news" is not a rewarding exercise and no attempt will be made here to describe such a plexiform abstraction in a crisp phrase or two. However, if we are to examine the weaknesses of current house organ practice, an examination of the nature of news is necessary. There are elements that must be present in any report of a situation if it is to qualify as news. Although the student of journalism examines each of these elements separately, no editor reading a piece of copy would consciously try to analyse its news content

as being compounded of so many parts of this element, so many parts of that, like a cake recipe. Nevertheless, deep in the recesses of his active mind, as it assimilates a score of details in the editing process, he is checking for the fundamentals of news value. Neglecting one of these fundamentals in some degree, the story displays a fatal weakness as a piece of news.

The element of time is inherent in the word "news" itself. It is almost self-evident that an event must be relatively recent if a report of it is to qualify as news. The recency is relative to how frequently the journal in which the item is to be published is issued and to the periodicity of competitive publications. For a daily newspaper an event, or the revelation of an event, must have occurred within twenty-four hours if the report is to be fresh. Newspaper editors are constantly updating stories, using more recent developments to keep an aging news story alive. For radio newscasts items as old as six or eight hours are often considered too stale.

The Current Nature of News

Although time considerations are less exacting, house organs too often report happenings that are embarrassingly old; Christmas parties are recorded in issues that appear late in January or early in February; the plant picnic story sometimes reaches the reader long after the children are back at their school desks. The problem can best be met by increasing the frequency of publication. A plant paper that appears as a four-page issue once a week will seem fresher than a sixteen-page splurge once a month. The wise editor will set up realistic deadlines and demand strict adherence to them in order to keep his material from appearing dated.

The stultifying effect of musty news in an employee publication is most evident when an important company story breaks; the announcement of an addition to the plant, the appointment of a new manager, or news of comparable importance. It is mandatory, not alone from the standpoint of tact, but also from that of good news play, to use a story of such prominence as the lead story in the employee publication. It is likely that the local dailies will have used the story at some length, and if the house organ appears two or three weeks later with the same story, perhaps the same company handout without the disguise of a rewrite, the effect can only be negative. It is not meet that important company announcements should be held up or timed to suit the needs of the employee magazine, but management can help by giving the editor sufficient advance notice to allow him to adjust his publication schedules to catch the big story in an issue soon after it breaks. If this is not practical, then management might help the editor find a new angle to use in updating his story.

Timing the Features

Another aspect of the time element in news, timing of feature material, is often recognized by house organ editors in its more common applications. It is patent that the Christmas feature is used in December, that how-to-beat-the-heat features are used in July and August issues, not in October or November. In newsrooms, the search for the tie-in story and the side-story are no more than the application of timing.

Editors of employee publications can exploit this simple principle to greater effect by keeping a close watch on the news of the day. The currents of national and international news touch every individual and every business in Canada. Even international news events may be used to tie in house organ stories. Does your company do business in South Africa? Does it have an agency or a branch at the Cape? If so, why not include a story of that South African operation now, when South Africa is on every front page? Feature stories will be more effective if they can be hung on a newspeg. If the editor is planning a feature on the purchasing department, he might time it to coincide with the annual meeting of the Canadian Council of Purchasing Agents in October. It might well be that the company's purchasing agent will be elected to an office or take an active part in the deliberations. That would give the editor a chance to peg the feature on the news event. The peg might be internal. Perhaps a department is moving to new offices; perhaps there has been a new senior appointment. News events within the plant will often serve as an excuse to tell about the operation of a department. Without a newspeg, such articles seem forced or contrived.

The Importance of Local or Company News

Editors of employee publications are keenly aware of the element of proximity in news, without which house organs and local newspapers would be unnecessary. It is axiomatic that, all other things being equal, the report of an event close to home is more likely to be read than an account of a similar event some distance away. Most newspaper editors hold that a broken leg on Main Street is worth more in a news sense than three hundred dead in a famine in India. Local newspapers exist because people are interested in what goes on along Main Street. Otherwise one national newspaper would suffice for the whole country. House organs are read because employees want to know what is happening in their own plant. The editors of employee publications seldom disregard this principle, but it is placed in jeopardy when management insists on lengthy discussions of the "big issues", especially dogmatic treatises on the philosophy of private enterprise, and expositions of "what we are fighting for".

Proximity as an element in news means more than closeness in space. There is also a proximity of person that must be considered. The psy-

chologist has demonstrated that we are primarily interested in ourselves as individuals, after that in other people, people we know. If the chap at the next machine breaks his arm, that's news, and it will be news throughout the plant. Proximity of person is the principle that accounts for the personal columns in weekly newspapers and for similar columns that fill employee publications. Editors and executives with delusions of grandeur, who would make their publication a second *Saturday Evening Post,* are tempted to discard the plant chatter columns to make room for articles of greater scope. To succumb to that temptation would be to weaken the publication as a medium of communication. Surveys have disclosed that the chatter columns are the best read features in most house organs. The alert editor will, however, keep a tight rein on those columns lest they degenerate into mere gossip corners for small cliques close to the department correspondent.

Personalities in the News

There are people whose personalities or achievements are so outstanding that their names automatically command attention in the news rooms of the world. Even the minor activities of Winston Churchill and Dwight Eisenhower make the news columns of the daily paper. For the house organ editor, too, there are names that are of more than average news value. Usually these are the names of top executives, who are known to a greater number of the paper's readers than most of the personnel of the company. However, the editor must use some caution and not overplay executives' activities. In one Canadian house organ a few years ago the picture of the chief executive of the firm appeared seven times in one issue, and his name was mentioned in five news stories. It does not take a particularly vivid imagination to conjure up a picture of reader reaction to this obvious overplay.

The Importance of Personal Interest

To qualify as news a report must have an inherent interest for the reader or it must be important to him — important in that the information will have a direct, or a strong indirect, consequence for him personally. As an example, next April when Finance Minister Abbott brings down his budget, Canadian papers will each devote many columns to reports of Mr. Abbott's speech. When the budget is presented to the Australian Parliament at Canberra, Canadian papers will report it in one brief paragraph, if at all. The Abbott budget will affect every Canadian directly in many ways; hence its introduction is valuable as news in a Canadian paper, whereas the Australian budget is unlikely to affect Canadians at all, unless there should be some unusual tariff changes. Even then the consequence to most readers in Canada would be slight and indirect.

The House Organ as a Grapevine

Of all the news in an employee publication, company news is of greatest importance to the reader. The employee, whether he is on the executive level, or sweeps out the offices, is concerned about the company's changing position, its expansions, reorganizations, competitive position, management changes, new products, and new processes. The company's progress, or lack of it, affects the employee directly by adding or detracting from his personal security or his prospects of advancement. Too frequently management's reports to the employees through the house organ have been sketchy and so generalized as to be suspect. For this reason the employees in many a business prefer to rely on their own grapevine for the "real, inside story".

The reluctance of management to disclose information that would give aid and comfort to the competition is understandable, but there remains latitude for the inclusion of genuine company news in the employee publication without making disclosures that might hamper the firm's operations. A common technique for keeping readers informed on company matters is the question and answer column, with the answers written by executives who are close to problems brought up by correspondents. The success of the question and answer column is in direct ratio to the forthrightness of the answers and in inverse ratio to the number of questions dodged.

Other Items of Interest

Many stories that are quite legitimately included in news media have nothing of the element of importance in them in the sense that they do not affect the reader personally. They are merely interesting in that they appeal to one or other of the fundamental urges of man. We read in the newspapers of the attempt to scale Mount Everest by a party of Swiss mountain climbers. It is front page news, yet the result, whether or not the climbers reach the summit, has no personal importance for us. We are interested in the ascent and in the success of the attempt because it helps to satisfy our sense of adventure. Hundreds of kinds of news stories are interesting without being important. Hollywood gossip stories, the sports page (except for those who are betting men), the social pages, hobby articles, and most pictures are all news items in which intrinsic interest is the dominant element. Any piece of news must have either intrinsic interest or importance. Timeliness and proximity are not in themselves sufficient to make a report newsworthy.

Adequate Organization

Even though management agrees that the principles of good journalism should be followed in the employee publication, that is not in itself enough. There must also be a willingness to create and maintain an adequate organization competent in applying those principles.

Any house organ that is to approximate good journalistic standards will require a full-time editor, and if the publication is to appear fortnightly or more often, a second professional staff member will be required on at least a part-time basis. Basic requirements for an editor are, first, competence as a journalist and, second, an interest in and knowledge of the company's business. Seldom is it possible to find a person with both qualifications. Since it is more likely that the company will be able to teach the new editor the firm's business rather than good journalism, the logical arrangement would seem to be to select an experienced journalist as an editor and trust that he will learn the company's business as he goes about his work.

Problems of the Editor

Many house organs suffer because of the mediocrity of their editors. This was amply demonstrated in the United States by a survey conducted by the International Council of Industrial Editors and quoted in the November 1952 issue of *Fortune*. This survey revealed that of nine hundred internal house organ editors, three-fourths have held their jobs five years or less, sixty per cent spend half or less of their time on the house organ, and only one in six is a full-time editor. Three-quarters of them are paid less than $500 a month and three-fifths get out their publication without additional help. Less than a third have had previous news or feature writing experience. While comparable statistics are not available for Canada, there is reason to believe that the situation here is not dissimilar. In large corporations the house organ editor is usually the junior member of the public relations or advertising department, and in smaller companies, a non-professional who worked on the high school paper. Some Canadian companies, such as Ford of Canada and A. V. Roe Canada Ltd., are getting first rate editing, judging from the quality of their publications.

The house organ editor's tasks are often misunderstood by management. His job involves more than merely preparing copy for the printer, measuring to see if things fit, and making certain that there is something for the printer to print. The editor will have administrative work; he must make certain that all plant news and functions are covered; he will have to be sure that each department has its correspondent and will have to keep pressure on that department's reporter to get copy and get it on time to meet deadlines. The editor, unless he has professional assistance, will, himself, have to cover the more important news stories. It should be remembered that a reporter or a magazine article writer spends at least three hours hunting facts for every hour he sits before his typewriter. Although there is no substitute for leg-work, it is time-consuming, and for the editor who is hard-pressed for time, skimping on fact-gathering is the easiest out. An editor with sufficient time to

work with his head as well as with his hands will be able to coach non-professional employees as house organ reporters. This also takes time, but if diligently pursued is a time-saver in the long run. A well-coached staff of part-time contributors takes much of the pressure off the editor and keeps the paper fresh through variety in style.

A Practical Example

The trouble with theories based on abstracts like the elements of news is that it is hard to prove with cold, hard fact that the theories are any good. The down-to-earth business man is likely to puff quietly on his cigar while you talk, and demolish you at the end with a quick "Show me." I should like to quote part of an article written by Crawford Gordon Jr., President and General Manager of A. V. Roe Canada Ltd., for the first issue of that company's employee publication:

> "One of the penalties of our growth is that we have lost much of this easy communication. We cannot now get together in the same way to talk things over in a friendly fashion. Our many complicated problems chain us of necessity to our desks or our machines. It is very unfortunate.
>
> "In a sincere attempt to give us back something of that old-time sociability, we are presenting today the first issue of a new plant tabloid newspaper. We do not want this newspaper to be merely an ineffectual symbol of management's goodwill or a phony representation of what management think is employee opinion . . .
>
> "The tabloid's standards will be that of any good newspaper. Interesting and significant news will get predominance, and editorial opinion will be kept out of the news columns."

Mr. Crawford's theories on employee publications are in concert with those advanced in this article, but he has gone one step farther. He has an exceedingly fine and, I am sure, effective employee publication to prove the theory. It is to be hoped that in the near future it will be one of many which prove that employee journals can provide an efficient and effective method of communication within the business firm.

Lighting in Industry

J. W. Bateman

Higher quality, lower costs, and greater volume are the ever-present demands made on modern industry. All of these are brought about to some extent by good working conditions in our factories. "More light, and better light, help all along the line," says Mr. Bateman, in creating these better working conditions. How to get the most light and the best light for many specific industrial situations is illustrated in this article by the Manager of the Lighting Institute, Canadian General Electric Company Limited.

REMARKABLE advances in lighting in industry have been witnessed during the last ten years. These advances are significant in their contribution to our industrial output and the economy of the country. However, not all industrial executives are aware of the benefits now possible with better artificial lighting, nor have they followed the latest practices in their plants.

The Cost of Lighting

It has been said that "Good light pays for itself," and that "The cost of poor and inadequate light is high." The relative cost of electric lighting in this country is low. The consumption of electricity per capita is high, power rates are low, and the cost of light sources is low — in general lower than before 1939, a situation which is true of very few other commodities.

For instance, in the case of fluorescent light sources which are so generally selected for new installations today, the user of 40-watt fluorescent lamps obtains 20 times as much value for his dollar as he did in 1939, and in addition, today's dollar is not the same as the 1939 dollar. The light output of this lamp was increased more than 50%, its average life, 5 times, and its list price, reduced from $3.90 to $1.25. This advance has been due to improvements in lamp design and manufacturing techniques, and to increased demand which lowered manufacturing costs.

In building construction today, it is taken for granted that electric lighting will be used in interiors. The electric lighting system may be

well designed on the basis of the best lighting knowledge available, or it may be installed with little consideration of the lighting needs or the results which will be produced. Actually the difference in cost between a poor or inadequate system of lighting and a proper system is usually not great. As a matter of fact, it is possible to spend just as much money on a poor system of lighting which will not fulfill the requirements as on one which does.

According to one relatively large Canadian manufacturer, it takes more than $6,000 invested in buildings, equipment, and inventories to provide one person with one job. Some studies made in the past have shown that the lighting installation accounts for about 2% of such an investment — $120 in this case — which seems like an extremely low proportion. This figure naturally varies a great deal, depending on the type of building, the type of lighting installation, and the type of work, but in any event, it is relatively low. Without light, production would not be possible, and the kind of lighting used has a direct relation to the usefulness of the area.

Other estimates indicate that lighting costs as a part of operating costs amount to approximately one-half of 1% of production costs; that is, to produce a $1.00 item, the lighting costs .5c. Usually the lighting has an important influence on the product at the various stages of manufacture, and on actual production costs.

An interesting assessment of the cost of light is to figure the cost per hour per worker. Take the simple case of an office worker: Assume that the space occupied per worker is 100 square feet. This area can be well lighted for an annual owning and operating cost of $20.00. If the hours worked per year are as long as 2000, and the lighting used all these hours, the cost per hour is 1 cent. If the salary is as low as $2000.00, or $1.00 per hour, then adequate lighting and salary can be covered with $1.01 per hour. The cost is $1.00 per hour for the worker with no artificial lighting, and $1.01, with proper artificial lighting, and presumably somewhere in between, with poor or mediocre lighting. A similar analysis can be made of the cost of lighting for the factory worker.

When the contribution that lighting can make to increased output, less spoilage, better product, fewer errors, increased safety, improved morale, better housekeeping, better management, and happier working conditions is fully realized, the cost seems very low indeed.

Light Sources

There are many different light sources used in industrial lighting. These are mainly incandescent tungsten filament lamps, mercury vapour lamps, and fluorescent lamps. All serve useful purposes.

Tungsten filament lamps vary in size from small low wattage lamps to those of high wattage, and while lamps as high as 50,000 watts have been made, usually the 1500-watt size is the largest used for general lighting in factories. Efficiencies for the common sizes from 200 watts to 1500 watts vary between 17 lumens per watt and 22 lumens per watt.

Mercury vapour lamps range from 100 watts to 3000 watts, and efficiencies vary between 33 lumens per watt and 50 lumens per watt.

Fluorescent lamps range in size from 6 inches to 96 inches, and in wattages, from 4 watts to 100 watts. Efficiencies of the lamps used for general lighting, depending on the lamp size and colour, vary between 24 lumens per watt and 70 lumens per watt.

Thus there is a good selection of artificial light sources to suit various purposes. The selection of the best source for a particular application depends on such factors as first cost, maintenance cost, life, size, radiant heat, colour, spectral characteristics, efficiency, and even personal preference. Often two or three different light sources may be about equally satisfactory for a lighting installation.

Filament Lamps

Tungsten filament lamps have been the principal light source used during the past forty years. They are simple to operate, require no auxiliary equipment, and are relatively low in cost, which usually means lowest initial cost of lighting installation. The incandescent filament approaches a "point" source of light, which permits accurate and flexible control of the light. Direct concentrating types of reflectors can be used if required. High wattage sizes are suitable for high mounting, and fewer fixtures are required.

Filament lamps today are available in many forms. In the lower wattage lamps, bulbs with the inside frosted finish are usually used. This finish diffuses the light. Just within the last few months a new white finish has been applied to the inside of the bulbs of 60 and 100 watt lamps. This new silica coating provides excellent diffusion of the light with practically no absorption.

Rapidly increasing use is being made of lamps with reflectors as a component part of the bulb. Many of these use the same efficient aluminum reflector as the all-glass sealed beam automobile headlamp. One new lamp for general use is in a bulb of the same size, made with the same heavy glass. It is a 300-watt 115-volt lamp which gives a narrow beam of light of approximately 80,000 c.p. A smaller 200-watt size produces about 45,000 c.p. These are companion lamps to the more familiar 150-watt PAR-38 spot and flood lamps used for interior and exterior lighting. The heavy glass in these lamps will not break in rain or snow.

Blown bulb reflector lamps are made in various sizes from the 75-watt R-30 to the 500-watt R-40, and some are made with hard glass for outdoor service.

A relatively new type of reflector lamp is of particular interest to industrialists. It is the R-52 bulb lamp which comes in 500-watt and 750-watt sizes. The shape of the bulb is such as to provide an efficient distribution of light for medium and high bay applications. The relatively flat lower part of the bulb through which the light is distributed will collect practically no dust or dirt, and any which does settle on the neck or sides of the bulb has no effect on the efficiency since the reflector is on the inside. This reflector maintains high efficiency with very little depreciation throughout the life of the lamp, and each time a lamp is replaced, a new reflector is obtained.

ENGINEERING DATA ON PAR PROJECTOR LAMPS

Wattage	Bulb	Type	Design Life Hours	Approximate Initial Maximum Candle-power	Beam Spread to 10% Maximum - Degrees
150	PAR38	Flood	2000	3,500	60 x 60
150	PAR38	Spot	2000	12,000	30 x 30
200	PAR46	Spot	2000	45,000	23 x 16
300	PAR56	Spot	2000	80,000	15 x 20
300	PAR56	Flood	2000	25,000	20 x 35

ENGINEERING DATA ON REFLECTOR LAMPS

Wattage	Bulb	Type	Design Life Hours	Approximate Initial Maximum Candle-power	Beam Spread Degrees
75	R-30	Spot	2000	2000	30
75	R-30	Flood	2000	475	60
150	R-40	Spot	2000	7000	30
150	R-40	Flood	2000	1400	60
300	R-40	Spot	2000	16,000	30
300	R-40	Flood	2000	2800	60
500	R-40	Spot	2000	20,000	30
500	R-40	Flood	2000	4000	60
500	R-52		2000	4000	100
750	R-52		2000	5500	100

Fluorescent Lamps

The fluorescent lamp continues to assume a place of increasing importance in industrial lighting. The advent of this new type of light source has meant more to factory lighting than to any other application.

While the invention of the tungsten lamp was a great step forward compared to the carbon filament incandescent lamp available before, the development of a practical fluorescent lamp for general lighting was an even greater advance. Year by year lamp manufacturers had striven

for increases in efficiency in tungsten lamps of one or two per cent, but with the fluorescent lamp efficiency went up 100% to 200% for "white" fluorescent lamps, and more than 100 times for some colours.

Not only was more light produced for the wattage consumed, but there was much less radiant heat in the light. Fluorescent lamps are relatively cool, and five times as much light can be used for the same heat sensation as with incandescent lamps.

Furthermore, fluorescent lamps are extended sources of light of relatively low brightness and therefore are less glaring and minimize shadows. It was these advantages which brought to industry better lighting — much better in quality and distribution than that provided by filament lamps in standard industrial reflectors.

Of course, everything did not favour the fluorescent lamps. They did not work directly off the lighting circuit, but required the use of an auxiliary or ballast, and at the outset, starters. However, in spite of the necessity of the auxiliary equipment, the advantages of fluorescent were so great that the new light source gained immediate acceptance. At the present time it is the biggest lighting factor in new lighting and relighting of industrial plants.

Since fluorescent lamps were introduced in Canada in 1939, a great deal of progress has taken place. Today the light output of a 40-watt white fluorescent lamp is 2500 lumens, more than 50% higher than that of the 1939 lamps; the rated average life is 7500 hours, five times the 1939 figure; and the price is only one-third. Thus the number of lumen-hours per dollar received from a lamp today is more than 20 times that in 1939. This represents exceptional progress in light source development and value due to the contributions of research and improved manufacturing techniques.

Fluorescent lamp characteristics limit them to relatively low wattage, although the light output of the 96-inch T-12 lamp is nearly as great as a 300-watt tungsten lamp. The 96-inch T-12 lamp operated at 425 m.a. and 74 watts is rapidly becoming the most popular lamp. Its high light output, high efficiency, instant starting, and long life features make it very acceptable for general lighting. As compared to 40-watt preheat installations, the relative number of parts is only 7 to 22. For instance, a two-lamp 96-inch T-12 fixture with lamp lumens of 9900 requires one ballast, four lampholders, and two lamps — a total of 7 parts, whereas two two-lamp 40-watt lamp fixtures with a light output of 9400 lumens require two ballasts, eight lampholders, four starters, four starter sockets, and four lamps — a total of 22.

The line of fluorescent lamps is now made up of lengths from 6 inches to 96 inches and wattages from 4 to 100 watts. There are two sizes of circline fluorescent lamps—8¼ inches and 12 inches in diameter. A 16-inch diameter circline is just being introduced. Fluorescent lamps come in various colours such as red, pink, gold, green, blue, daylight, standard cool white, deluxe cool white, standard warm white, deluxe warm white, white, and soft white. The standard cool white is generally recommended for industrial lighting. They come in various types: general line, slimline, circline, preheat, instant start, rapid start, trigger start, low temperature, high humidity, cold cathode, black light, etc. All in all, there are more than 250 different fluorescent lamps, and the present annual demand in Canada is more than 5 million.

The average rated life of 15, 20, 25, 30, 40, 90, and 100 watt preheat lamps, the 40-watt T-12 instant start lamp, and the T-12 slimline lamps, is 7500 hours. The rated average life of the T-6 and T-8 slimline lamps is 6000 hours. These ratings are based on three burning hours per start. For operation at 6 and 12 burning hours per start, life ratings are increased by a factor of approximately 1.15 or 1.35 respectively.

GENERAL LINE FLUORESCENT LAMPS

Watts	Bulb	Length	Lumens Standard Cool White
4	T-5	6″	90
6	T-5	9″	200
8	T-5	12″	310
13	T-5	21″	600
14	T-12	15″	520
15	T-8	18″	690
15	T-12	18″	615
20	T-12	24″	915
25	T-12	33″	1380
30	T-8	36″	1700
40	T-12	48″	2350
40	T-17	60″	2350
90	T-17	60″	4850

SLIMLINE FLUORESCENT LAMPS
(incomplete listing)

Length	Bulb	Lamp Current m.a.	Wattage	Lumens Standard Cool White
42″	T-6	120	17.5	1010
64″	T-6	200	37	2300
72″	T-8	200	36.5	2350
72″	T-12	425	55	3400
96″	T-8	200	49	3300
96″	T-8	300	65	4300
96″	T-12	425	74	4950

Mercury Lamps

Mercury vapour lamps have long had a place in industrial lighting. Early in the century the Cooper-Hewitt mercury lamp was introduced and found considerable application in the textile and metal-working industries. Its efficiency was not much higher than 15 lumens per watt, and it has now been replaced largely by the high intensity mercury vapour lamps and fluorescent lamps with efficiencies from 2 to 3 times greater.

Mercury vapour lamps of modern types used in industry are usually the 100-watt, 400-watt, 1000-watt, and 3000-watt sizes. They are characterized by high efficiency and long life.

The 400-watt size is the one largely used. The H400A1 lamp has a lumen output of 15,000 lumens, approximately that of a 750-watt incandescent lamp, and the H400E1, 20,000 lumens, which approaches the light output of a 1000-watt incandescent lamp. The E1 lamp has a shorter arc tube and overall length and is of more recent design. Its electrical rating is the same as the A1, and it will operate from the same transformers. Thus simply by changing from the A1 lamp to the E1 lamp in an installation it is possible to obtain one-third more light. The A1 lamp has a bulb diameter of 2 inches and an overall length of 13 inches; the E1 lamp a bulb diameter of $2\frac{1}{2}$ inches and an overall length of 11 inches. Both are equipped with regular mogul bases, but, of course, cannot be operated directly from the line, but need special transformers as do all mercury lamps.

The 3000-watt lamp has a light output of 120,000 lumens and comes in a $1\frac{1}{8}$-inch diameter tube 55 inches long. Thus this single source gives approximately as much light as six 1000-watt tungsten filament lamps.

All mercury lamps require a warm-up time after turning on before reaching full light output. This time varies from 3 to 14 minutes for different lamps. Also, if the power circuit is interrupted causing the lamps to go out, they require approximately the same length of time to cool off before the arc will restrike again. This characteristic is a disadvantage, and it is customary to recommend combination mercury-incandescent systems on this account and for better colour rendition. Usually for high mounting, where mercury is most applicable, two 400-watt lamps are mounted side by side, operating from a two-lamp transformer and alternately spaced with 1000-watt incandescent lamps. The overall efficiency of the E-1 mercury lamp is 46 lumens per watt, and of the combination mercury-incandescent arrangement, 33 lumens per watt. The use of the incandescent tungsten filament lamp units not only assures light immediately when the circuit is turned on, or power comes on after an interruption, but also provides the desirable red component which is lacking in mercury light.

Straight mercury lighting is, however, easier to install. While tungsten filament lamps should be used on 120-volt circuits, mercury lamps operate just as satisfactorily, or more so, from higher voltage distribution systems, which mean smaller wire sizes. The use of two different distribution systems overhead complicates the wiring installation. Straight mercury is upwards of 50% higher in efficiency than the combination system. Therefore, if there is sufficient local lighting using incandescent or fluorescent lamps, or if there is an emergency system which comes on when power is interrupted, this may serve to offset the need for the combination lighting if the spectral characteristics of the mercury lighting are satisfactory for the work. Also, if there is no power, there is no lighting of any kind unless an emergency lighting system is available. In most areas power interruptions are infrequent, and if so, this situation is not too serious.

In the 400-watt size there are now available five different lamps. Specifications of these are as follows:

	H400A1	H400E1	H400J1	H400R1	H400RC1
Rated lumens	15,000	20,000	17,000	16,000	12,300
Rated Life:					
5 burning hours per start.	4000	4000	4000	4000	4000
10 burning hours per start.	5000	5000	5000	5000	5000
Bulb	T-16	T-20	BT-37	R-52	R-52
Base	Mogul	Mogul	Mogul	Mogul	Mogul
Maximum overall length	13"	11"	11½"	11¾"	11¾"
Supply voltage	118,236	118,236	118,236	118,236	118,236
Transformer secondary voltage	220	220	220	220	220
Lamp operating voltage	135	135	135	135	135
Lamp starting current (amps)	5	5	5	5	5
Lamp operating current (amps)	3.2	3.2	3.2	3.2	3.2
Approx. time to full light output (minutes)	8	8	8	8	8
Cooling time to restart (minutes)	5	5	5	5	5

Relatively recently a new colour-improved mercury lamp has been introduced. The colour improvement is obtained by the use of fluorescent powder on the inside of the outer bulb. This fluorescent substance or phosphor coating transforms some of the invisible ultra-violet rays of the mercury arc to longer wavelengths in the visible spectrum, including red light, which is lacking in the mercury arc. The resultant light is comparable in colour rendition to a mixture of light obtained by approximately one-third from filament lamps and two-thirds from regular mercury lamps. This better colour of light is obtained at a sacrifice of about 15% in total light output.

Two other new mercury lamps in the 400-watt size open up further applications of this form of lighting. These are the H400R1 and H400RC1. Both of these lamps have the same electrical characteristics as the standard H400E1, and therefore the same transformer may be used. These two lamps come with the R52 reflector bulb, which is proving very acceptable for many high and medium bay lighting jobs with filament lamps. The R-1 lamp has the high efficiency reflector bulb and a heavy density frost on the bottom. The RC-1 lamp has a light phosphor coating over the reflector portion of the bulb to contribute red radiation to the light. Both lamps are for use in high or medium bay lighting, and their features are particularly good where dusty or dirty conditions prevail. The light output is practically unaffected by the collection of dust and dirt on the lamp. The colour-improved RC-1 lamp is recommended where the better colour quality of light is desired.

In mercury lamps, the 1000-watt AH-15 lamp has been added recently. It is expected that this lamp will become relatively widely used since it is particularly well suited, both in effective light distribution and low cost, for many medium and high bay industrial areas. The high output of 52,000 lumens from one source as compared to 21,500 lumens from a 1000-watt filament lamp means a lot of light from one reflector, fewer units, and simplified maintenance.

Mercury vapour lamps are not generally applicable to 25-cycle lighting circuits, and their use has been confined pretty well to 60-cycle areas. With the standardization of 60 cycles in the industrial sections of Ontario, it is expected that advantage will be taken of mercury lighting in a much larger way in the future.

Lighting Cost Analysis

While the lighting requirements for any seeing task simply involve enough light of good quality, these requirements can be met in a variety of ways. For most applications, there is no method of lighting that is the only one that can be used. Illuminating engineers are likely to agree on the amount of illumination and the degree of quality desirable, but they may specify different types of luminaires and arrangements to accomplish the results.

There is available today a great variety of light sources, and these may be applied in many systems of lighting. To help in deciding what source and what system are best for any particular building or area, a cost analysis is interesting and useful. This is a comparison of the installation and operating costs of different systems providing the required foot-candles. One system may be low in first cost, but high in operating and maintenance expense, or the reverse may be true.

The primary interest in a cost analysis is in relative costs. One method is to compare these on a cost per luminaire basis, with the number of luminaires adjusted for equal maintained illumination. Another basis would be to compare the costs for a specific area.

On the cost per luminaire basis, the relative costs can be converted to actual costs for a particular installation in the following way: (1) divide the effective maintained lumens per luminaire by the foot-candles desired. This gives the area per *luminaire.* (2) Divide the area to be lighted by the area per luminaire, to get the *total number of luminaires* needed. (3) Multiply the number of luminaires by items 12, 13, and 21 in the table to obtain respectively the *total initial cost,* the *annual owning cost,* and the *annual operating cost.*

A 15% amortization rate is used in this analysis. This is based on a write-off of capital investment over a 10-year period, at 10% per year, plus 5% for interest, taxes, and insurance.

The installation and branch circuit wiring costs may vary considerably, depending on the conditions of each installation, such as mounting height, type of ceiling, method of suspension, size of light source, panelboard location, etc. The costs used here are based on some estimates from electrical contractors.

In preparing a typical cost analysis, certain assumptions have to be made. Operating costs have been determined for 2500 burning hours per year, at 1 cent per kilowatt hour power rate. The labour cost of lamp replacement is computed at 50c per lamp, with an extra 25c for preheat fluorescent lamps, to take care of the cost of servicing and replacing starters. The assumed cost of cleaning is 85c per luminaire for the fluorescent and 37½c for the incandescent unit. These costs can be expected to vary widely with conditions. It is, of course, suggested that for a specific installation, actual figures be used.

Coefficients of utilization have been taken for a room index of A, that is, a relatively large room, ceiling reflection 50%, and walls 30%. Standard cool white fluorescent lamps have been selected, inside frosted incandescent, and 60-cycle operation.

The results of this cost analysis indicate that there are different fluorescent systems which may be employed, and that the costs are relatively the same. There are several other fluorescent systems which have not been compared in this analysis, but those taken represent present general practice.

It should be noted that while the initial cost of a simple incandescent system is about 65% of the fluorescent, even at such a low power rate as 1c per kilowatt-hour, the annual operating cost is about double, and the combined owning and operating cost, 33% higher than regular fluorescent. At a 2c power rate, this latter figure is about 60% higher for the incandescent system.

TYPICAL INDUSTRIAL COST ANALYSIS — LOW BAY AREA

Basic Data	Fluorescent Preheat Start- 4-40w. T12 8' Section	Fluorescent Inst. Start- 4-40w. T12 8' Section	Fluorescent Preheat Start- 2-90w. T17 5' Section	Slimline Fluorescent 2-96 T12 8' Section	Incandescent 300 w.
1. Rated Initial Lamp Lumens per Luminaire	9400	9400	9700	9900	5510
2. Rated Lamp Life	7500	7500	7500	7500	1000
3. Lamp Wattage	40	40	90	74	300
4. Watts per Luminaire (including ballast watts)	191	204	218	180	300
5. Coefficient of Utilization	0.67	0.67	0.70	0.68	0.70
6. Maintenance Factor	0.70	0.70	0.70	0.70	0.70
7. Effective Maintained Lumens per Luminaire (1x5x6)	4410	4410	4750	4710	2700
8. Relative Number of Luminaires needed for equal maintained foot-candles	1.00	1.00	0.93	0.94	1.60
Initial Costs					
9. Estimated Luminaire cost	$38.50	$44.00	$40.00	$41.50	$ 9.00
10. Installation and branch circuit wiring cost (estimated)	$20.00	$20.00	$20.00	$20.00	$16.00
11. Estimated Lamp Cost	$ 4.00	$ 4.32	$ 5.36	$ 7.12	$ .56
12. Total Initial Cost per Luminaire	$62.50	$68.32	$65.36	$68.62	$25.56
13. Annual Owning Cost per Luminaire (15% of 9+10)	$ 8.78	$ 9.60	$ 9.00	$ 9.23	$ 3.75
14. Relative initial cost for equal maintained foot-handles	100%	109%	97%	103%	65%
Annual Operating Costs					
15. Burning hours per year	2500	2500	2500	2500	2500
16. Annual Energy Cost 1c/kw.hr.	$ 4.78	$ 5.10	$ 5.45	$ 4.50	$ 7.50
17. Number of lamps replaced per year	1.33	1.33	0.67	0.67	2.50
18. Lamp cost per year	$ 1.33	$ 1.44	$ 1.79	$ 2.38	$ 1.40
19. Labour cost of lamp replacement	$ 1.00	$ .67	$ .50	$ .34	$ 1.25
20. Cost of cleaning twice a year	$ 1.70	$ 1.70	$ 1.70	$ 1.70	$ .75
21. Total Annual Operating Cost per Luminaire (16+18+19+20)	$ 8.81	$ 8.91	$ 9.44	$ 8.92	$10.90
22. Relative Annual Operating Cost for equal maintained foot-candles	100%	101%	100%	95%	198%
23. Relative Total Annual Cost for equal maintained foot-candles	100%	105%	97%	97%	133%

TYPICAL INDUSTRIAL COST ANALYSIS — HIGH BAY AREA

Basic Data	Incandescent 2-1000w. PS-52	Incandescent 2-750w. R-52	Mercury 2-400w. H-400E1	Combination 2-H400E1 1-1000w. PS-52	Mercury Colour-Improved 2-H400J1	Mercury 1-H1000A15
1. Rated initial lamp lumens per luminaire group	43,000	28,400	40,000	61,500	34,000	52,000
2. Rated Lamp Life	1000	2000	5000	(5000) (1000)	5000	4000
3. Watts per luminaire group (including ballast watts)	2000	1500	860	1860	860	1040
4. Coefficient of Utilization - Room Index F— Ceiling 50% Reflection				(.55)		
Walls 30% Reflection	.62	.62	.55	(.62)	.50	.55
5. Maintenance Factor	.65	. 8	.65	.65	.65	.65
6. Effective maintained lumens per luminaire group (1x4x5)	17,350	14,100	14,300	22,950	11,050	18,600
7. Relative number of luminaire groups needed for equal maintained foot-candles	1.00	1.23	1.21	.76	1.57	.93
Initial Costs						
8. Estimated cost of luminaire group (including ballasts)	$40.00	$12.00	$108.00	$128.00	$108.00	$63.00
9. Estimated cost of installation and branch wiring	$70.00	$65.00	$50.00	$80.00	$50.00	$40.00
10. Estimated initial lamp cost	$ 6.48	$ 9.52	$29.20	$32.44	$40.00	$40.00
11. Total initial cost per luminaire group	$116.48	$86.52	$187.20	$240.44	$198.00	$143.00
12. Annual Owning Cost per luminaire group (15% of 8+9)	$16.50	$11.50	$23.70	$31.50	$23.70	$15.45
13. Relative initial cost for equal maintained foot-candles	100%	92%	194%	157%	267%	114%
Annual Operating Costs						
14. Burning hours per year	2500	2500	2500	2500	2500	2500
15. Annual energy cost 1c/ kilowatt hour	$50.00	$37.50	$21.50	$46.50	$21.50	$26.00
16. Lamp cost per year	$16.20	$11.90	$14.60	$22.70	$20.00	$20.00
17. Labour cost for lamp replacement	$ 5.00	$ 2.50	$ 1.00	$ 3.50	$ 1.00	$ .50
18. Cost of cleaning twice a year	$ 5.00	——	$ 5.00	$ 7.50	$ 5.00	$ 2.50
19. Total Annual Operating cost per luminaire group (15+16+17+18)	$76.20	$51.90	$42.10	$80.20	$47.50	$49.00
20. Relative Annual Operating Cost for equal maintained foot-candles	100%	84%	67%	106%	98%	60%
21. Total Annual Owning and Operating Cost per luminaire group (12+9)	$92.70	$63.40	$65.80	$111.70	$71.20	$64.45
22. Relative Total Annual Cost for equal maintained foot-candles	100%	84%	86%	92%	120%	65%

Many people may have the idea that fluorescent lighting is high in cost as compared to incandescent lighting, but a cost analysis shows that such is not the case. In addition, in the examples taken, the quality of the light from the fluorescent systems is much better—better in colour, cooler, only one-fifth the radiant heat, much less glaring, and avoids troublesome shadows. It should be pointed out that a cost analysis of this type only compares costs and does not rate the lighting systems from a quality standpoint.

The typical high bay area cost analysis compares six different systems of lighting. These are: (1) high bay incandescent lamp reflectors, with 1000-watt PS-52 bulb general service lamps, (2) reflector type incandescent lamps, 750-watt R-52 bulb, with drip shield, but no separate reflector, (3) high bay mercury lamp reflectors with 400-watt mercury lamps H-400-E1, (4) combination mercury-incandescent system, with equipment as in (1) and (3) above, (5) high bay mercury lamp reflectors with 400-watt colour improved mercury lamps H-400-J1, and (6) high bay mercury lamp reflectors, with 1000-watt mercury lamps, H-1000-A15.

Thus two incandescent lamp systems, three mercury lamp systems, and one combination incandescent and mercury lamp system are compared. This comparison assumes that all of these systems are applicable to a particular installation. It is true, of course, that one system may be more suitable than another for a specific area. For instance, colour rendition may be very important, and if so, systems (3) and (6) would not be acceptable. Perhaps conditions are such that the delay in the restarting of mercury lamps is definitely undesirable, and this would rule out systems (3), (5), and (6).

It should also be pointed out that this cost analysis does not compare the quality of the light, either spectrally or from an eye comfort point of view.

Such a cost analysis does compare the efficiencies of the different systems, the first costs, the power consumed, the lamp and maintenance costs, and the overall cost of producing light. It should be noted that high initial cost does not necessarily mean high operating cost; usually the reverse is true. In general, the mercury lamp systems are higher in first cost than the incandescent systems, but lower in operating and overall costs. For most applications, mercury lamps are not very acceptable on 25-cycle electric supply because of the flicker produced. It is expected that their use will be much more widespread with the standardization of 60-cycle frequency in Ontario.

Group Replacement of Lamps

A study of lamp maintenance problems indicates that often better lighting and lower overall costs can be realized by adopting a policy of

group replacement of lamps. Group replacement involves the procedure of completely relamping an installation when the light sources have reached some predetermined portion of life, usually 80%. The last hours of life left in a group of lamps are not as useful, and are as costly in frequency of replacement or maintenance as the last few miles in an automobile tire.

Most lamp burnouts occur relatively close to rated life, and therefore frequent and costly trips up a ladder are avoided where lamps are changed just before the period of high burnouts. One method is to set aside a quantity of lamps equal to 20% of the installation at the time of installation. Then when these have been used up for any early failures which occur, the job is completely relamped, saving 20% of the best-looking lamps for spot replacement before the next time of group relamping. If relamping is done at the same time as a regular cleaning, then the cost of replacement is low. The cost of the lamps themselves is low compared to the cost of lamps and power, perhaps 1/5 or less, and the cost of the lamps is low as compared to the cost of the time taken in bringing a ladder and replacing. This is particularly true today with the rates of pay of electrical and maintenance men.

Most general service incandescent lamps give most economical lighting at their rated lives of 1000 hours, reflector lamps at 2000 hours, fluorescent lamps at 7500 hours, and mercury lamps at 4000 to 5000 hours. Thus all these lamps are relatively long in life performance, and therefore require proper maintenance for most efficient and economical results.

Specific Lighting Problems

While overhead lighting systems are required for practically all industrial interiors, there are often specific seeing needs not completely satisfied by the general lighting. These special problems require some type of supplementary lighting which may consist of equipment located close to the work or at some distance. A careful analysis of the lighting requirements and careful selection and installation of the lighting equipment will pay off in improved seeing and other benefits. The lighting equipment should be fixed in position so that individual adjustment is discouraged unless essential.

The lighting units should light the work, but should not be glaring or interfere with the vision of other workers. Also, the brightness ratio between the work or work area, and the surroundings, should be within proper limits for visual comfort. If the work is lighted to a high brightness, and the general surroundings are comparatively dark, the contrast between the two is objectionable. Satisfactory conditions are reached

when the ratio between the brightness of the task and the brightness of the adjacent surrounding area does not exceed 5 to 1. Light colours in the area surrounding the work and sufficient general illumination are essential. Different colours may be used to improve the visual environment.

Most tasks which require special lighting can be lighted by one or more of three techniques: (1) supply more light than is provided by the general lighting system, (2) utilize a special control of light distribution, or (3) use a light source of special characteristics.

More light on the work may be provided by additional lighting units or special equipment. Lamps with self-contained reflectors may be mounted close to the work or at some distance from it. Standard filament or fluorescent lamps in suitable reflectors can also be used.

Industrial tasks which require special lighting can usually be divided into two classes: those requiring large diffuse luminaires, and those best served by the use of concentrating luminaires.

Large Diffuse Sources

Where work surfaces or parts of them are shiny, such as in the inspection of highly polished sheet metal, low brightness luminous panel-type luminaires are desirable. Luminaires should be relatively uniform in brightness. Micrometers and metallic scales and dials involved in the operation of machine tools are much easier to read under such sources than under small high brightness units. Fluorescent lamps are often the best sources for these units.

Transparent objects such as glass jars, bottles, bulbs, clear plastics, etc. can be examined for blister, cracks, chips, and air bubbles when viewed in front of a large luminous panel.

Concentrating Sources

Surface flaws, irregularities in surface shape, pit marks, scratches, and cracks in non-specular or matte materials are most easily seen by light which strikes the surface obliquely. The irregularities in the surface cast shadows and reveal the defects by contrast.

Narrow-beam reflectors, lens units, or spotlamps are generally necessary for accurate control of the light. Reflector and projector lamps such as the R-30, R-40, PAR-38, and PAR-46, are well suited to such applications.

Black Light Applications

So-called "black light", or ultra-violet radiations which cause fluorescent or phosphorescent materials to glow, is finding application in industrial inspection. Fine fluorescent powder wiped across a metal sur-

face will lodge in cracks or imperfections and show these defects up clearly when the surface is examined in the dark under black light. In laundries, articles marked with fluorescent ink that is invisible under normal light can be seen easily and quickly under "black light" and sorting is facilitated.

Mercury lamps with their visible radiation screened out by special ultra-violet transmitting glass filters are generally used to provide the near ultra-violet radiations required for these applications. Black light fluorescent lamps are also available as sources.

Colour Matching and Discrimination

The problems of colour matching, colour discrimination, colour inspection, etc. have always been with us. Of old, colourists made a habit of using the north skylight for their colour work. The reasons for this are that the light from the north sky is the most constant, is not direct sunlight, is well-diffused, and provides a good amount of illumination at a window when there are high values of daylight outdoors. These are all important considerations in colour matching and colour discrimination.

Actually, this light is not very good spectrally for colour work; it is too blue. Whereas white light with a proper balance of all the colours is around 5000 degrees Kelvin in colour temperature, north sky goes as high as 26,000 degrees Kelvin. Colour temperature describes the absolute temperature in degrees Kelvin of a theoretical black-body radiator whose colour matches the source in question. Such a body is black at room temperature, red at 800°K, yellow at 3000°K, white at 5000°K, pale blue at 8000°K, and brilliant blue at 60,000°K.

Average noon sunlight is about 5300°K, the standard range of filament lamps is 2500°K to 3000°K, a 500-watt daylight lamp, 4000°K, daylight fluorescent lamps, 6500°K, standard cool white 4500°K, and a uniform overcast sky, about 7000°K. In a study made recently some textile colour matchers preferred colour temperatures of about 7500°K at 100 foot-candles and as low as 5700°K when the illumination was 300 or more foot-candles.

Lighting of Outdoor Areas

In these days when industrial plants are bulging at the seams, perhaps better use can be made of outdoor areas. Of course, outdoor areas are used now for much material storage and handling and some work. It is realized that weather conditions limit the use that can be made of such spaces. However, where outdoor operations are carried on, they can be put on a 24-hour-a-day schedule with good lighting.

Generally, by the use of efficient high wattage outdoor floodlights, or some of the hard glass reflector flood lamps, it is a simple matter to

light such work areas or storage yards, and the cost is relatively low. Effective lighting helps the movement of raw materials into the plant, and of finished goods, out. Loading and unloading operations are speeded up; men work faster and make fewer mistakes when areas are well lighted, and there is less likelihood of accidents.

Good lighting provides effective plant protection too. Losses from pilfering are reduced, and trespass and sabotage, discouraged.

The advertising value of floodlighting should not be overlooked. The lighting may serve the dual purpose of plant protection or area lighting for useful purposes at the same time.

Recommended Practice of Industrial Lighting

Under the auspices of the Illuminating Engineering Society, some seventy committees are engaged in studies of light, lighting applications, and seeing. Out of these studies has come much basic information on light and sight and knowledge of what is best in lighting practice.

The Industrial Lighting Committee of the Illuminating Engineering Society has prepared a recommended practice for industrial lighting, of which there is a recent revision. This has been approved by the American Standards Association and, through a Canadian Standards Association Committee, is at the present time being considered for approval in Canada. The present standard in Canada is the *Recommended Practice of Industrial Lighting,* sponsored by the Department of Labour, Canada, and approved by the Canadian Engineering Standards Association in 1943. Thousands of copies of this standard have been distributed to industry in Canada through the Department of Labour, the Canadian Standards Association, and members of the Illuminating Engineering Society. This publication has been of invaluable help to architects, engineers, industrial management, and lighting people, in designing and establishing industrial lighting on a sound basis.

Now progress in lighting application, development of new techniques, new sources, and new concepts make a revision of this older standard, which was prepared some ten years ago, advisable.

The quantity of illumination required for any particular seeing task depends on the difficulty of the task, the surroundings, and the eyes. Of course, quality of illumination is important too, but more difficult to specify. General recommendations of the range of amounts of illuminations can be readily given. These are based on researches in vision, on experience of practice, and on the ability to provide desired values efficiently and economically.

GENERAL RECOMMENDED VALUES OF ILLUMINATION

Current Recommended Practice — Foot-candles in Service
(On task or 30″ above floor)

Task	
Most Difficult Seeing Tasks:	
Finest Precision Work	200-1000
Involving: Finest Detail Poor Contrasts Long Periods of Time	
Such as: Extra-fine Assembly; Precision Grading; Extra-fine Finishing	
Very Difficult Tasks:	
Precision Work	100
Involving: Fine Detail Fair Contrasts Long Periods of Time	
Such as: Fine Assembly; High-Speed Work; Fine Finishing	
Difficult and Critical Seeing Tasks:	
Prolonged Work	50
Involving: Fine Detail Moderate Contrasts Long Periods of Time	
Such as: Ordinary Bench Work and Assembly; Machine Shop Work; Finishing of Medium-to-Fine Parts; Office Work	
Ordinary Seeing Tasks:	
Involving: Moderately Fine Detail	30
Normal Contrasts Intermittent Periods of Time	
Such as: Automatic Machine Operation; Rough Grading; Garage Work Areas; Switchboards; Continuous Processes; Conference and File Rooms; Packing and Shipping	
Casual Seeing Tasks:	
Such as: Stairways; Reception Rooms, Washrooms and other Service Areas; Active Storage	10
Rough Seeing Tasks:	
Such as: Hallways; Corridors; Passageways; Inactive Storage	5

The Trend Today

The trend today is to provide better lighting than ever before in industry. New sources, new techniques, and greater knowledge of the advantages of better lighting make this the case.

Through research and development it has been possible to keep the cost of light sources low. In general, prices are below those prevailing before the war, and this can be said of few other commodities. The reason is that lamp-making equipment and methods have been modernized to turn out lamps at low cost in spite of the increased cost of labour and raw materials.

Thus more light can be provided without costs becoming too high. The advantages which accrue from good lighting are: (1) improved employee morale, (2) increased production, (3) improved safety, (4) less spoilage, (5) better product, (6) less labour turnover, (7) better housekeeping, (8) easier supervision, (9) better utilization of space, and (10) generally lower production costs.

Good lighting consists of an adequate quantity of light to see clearly and quickly the work being done, and proper quality of lighting for comfort.

The higher efficiency fluorescent and mercury vapour lamps make possible the very much higher foot-candle values of illumination found so desirable for many industrial applications today. Manufacturing in general is on a much more exacting basis; finer tolerances are required, and the finished product must be of highest quality. Goods must be turned out in volume and at low cost, and working conditions must be good. More light, and better light, help all along the line.

In the quality of the lighting provided in industry, that is, freedom from glare and proper distribution, rather remarkable advances are being made today. Newly designed fluorescent industrial reflectors which have a considerable component of upward light are coming into use. This upward light relieves the contrast of the reflector against its background and by lighting the upper portion of the room, greatly improves the general well-lighted appearance of the area. Brightness ratios are brought within reasonable limits. Also, the lighting and finishing of machines and backgrounds to keep seeing comfortable is being more generally practiced.

Factory seeing tasks are just as difficult, and often more intricate, than those of offices and schools. Therefore the same degree of high quality in illumination should be provided for the factory worker as is given to his fellow-worker in the office. Management has not always taken steps to see that this is done. It is to their advantage to do so.

Progress in Consumer Representation

Dorothy L. Walton

Many of our readers will undoubtedly be familiar with an article by Bernard DeVoto, which appeared in "Fortune" somewhat over a year ago. Mr. DeVoto, taking the part of a "consumer", voiced some specific complaints about the products and practices of business. One conclusion to be drawn from this article and a series written by certain businessmen in reply is that Mr. DeVoto, as a consumer, did not understand all of the problems of business. Another is that business does not always understand the people who buy its products. With this latter idea in mind, we feel that our readers might well profit from a discussion of just what it is that consumers want and how they are trying to get what they want.

The immediate question to be faced involves, of course, the identification of "the consumer". After all, every individual, whatever his primary function, is at one time or another a consumer. However, though we all have certain wants, likes, and dislikes as consumers, they are not usually given any wide organized expression.

The largest, most representative and most responsible voluntary consumer organization in Canada is the Canadian Association of Consumers (CAC). While this organization does not represent all consumers, it does speak for many of them and speaks with a firm voice. Consequently, we asked its president, Mrs. Dorothy L. Walton, to outline its background, who supports it, whom it represents, how it functions, what it has done, and what it wants to do. This outline does not answer all the questions one might raise, but it should help all producers and distributors to develop a somewhat clearer picture about consumers' thoughts and actions.

UNTIL comparatively recent times, the reaction of the consumer to changes in price or quality of goods was registered promptly and effectively directly to those who produced or distributed the wares she needed. As the organization of society became more complex and as a majority of our population became urbanized, the direct contact between individual producers, processors, distributors, and the customers was lost.

Other groups in the production and distribution field organized to cope with their own special problems, but the organization of consumers on an equal scale seemed impossible. Not until World War II, when the Government needed the collective help of consumers on the "home front" and made special efforts to obtain it, was anything like a nation-wide consumer organization established, and then only as a war emergency.

Origin of the Consumer Movement in Canada

The Consumer Branch of the Wartime Prices and Trade Board was established with the aid of the national women's organizations and local groups and functioned more effectively than the Government dared to hope. Thousands of women worked voluntarily in the Consumer Branch. Their support was enlisted to observe ration regulations and to conserve goods that were in short supply. Their opinions were sought and acted upon. Their questions were answered. For the first time, women learned what an important role they played, as chief custodian of the nation's housekeeping dollar, in helping to maintain Canada's economic stability.

Perhaps the most important function of the Consumer Branch was the publication and distribution of its *Consumer News*. Hundreds of thousands of copies of it were distributed every month to the women of Canada to explain the reasons behind rationing, prices, and shortages.

Thus women learned what could be done by united effort. They gained experience working together for a common cause. They learned that banded together, they, too, could be of service to their country during the war. They learned the importance of being well-informed and the value of channeling their opinions to Government and business and of receiving, in return, the answers to their questions.

The Consumer Branch of the Wartime Prices and Trade Board was disbanded shortly after war ended. However, the postwar inflation was serious enough to create a demand for a *peacetime* consumer organization to provide machinery through which the voice of the consumer could be heard.

Formation of the Canadian Association of Consumers

As a result of the spontaneous urging of women from coast to coast, the National Council of Women called together representatives of all of the fifty-six national women's organizations to consider the advisability and feasibility of establishing a voluntary peacetime consumer association. From their deliberations, the Canadian Association of Consumers was formed in September 1947 and sponsored by all of these national women's organizations.

It should be emphasized that the Canadian Association of Consumers was created out of the demand on the part of the women themselves. It was set up as an entirely voluntary, non-sectarian and non-partisan association, independent of Government and business. It was organized and planned by the women, and its policies and procedures are determined by the women. Membership is open to every woman in Canada, whether or not she belongs to another woman's organization.

Principles of the Canadian Association of Consumers

CAC was organized to develop a more enlightened opinion concerning economic affairs and consumer interests and to express this opinion in such a way as to benefit the home, the community, and the nation. It follows three guiding principles:

(1) It endorses the free enterprise or competitive system as it exists in this democratic country, believing it has contributed greatly to one of the highest standards of living in the world and has provided the greatest measure of protection for consumers generally.

(2) It endeavours to serve impartially, the best interests of *all* consumers and will not permit itself to become a pressure group for any one special interest or economic group at the expense of any other.

(3) It will not permit itself to be stampeded into emotional short-term decisions which are not in the best long-term interests of all.

In line with these principles, CAC aims to:

(1) provide a channel for bringing the views of consumers to the attention of Government, producers, trade, and industry, and also, a return channel for information from these to the consumer;

(2) study consumer problems and make recommendations for their solution;

(3) circulate information on matters of consumer interest concerning goods, qualities, standards, services, and values; and

(4) provide as strong a voice for consumers as national associations now give to trade, industry, labour, and agriculture, thus completing representation of the segments of our economy, in which the chief purchaser — the consumer — has too long been silent.

Basically, then, the CAC programme may be said to provide information and facts which will enable consumers to improve their standard of living through wise buying; to promote the development of better standards, uniform grading, and informative labelling of consumer goods by bringing enlightened consumer opinion and pressure to bear on Government and industry; to promote good consumer-merchant and good

consumer-farmer relations through a better mutual understanding; and to present the consumer view to Government boards and commissions and to industrial, trade, distributor, labour, and producer associations.

Operation of the CAC

Although a large measure of support comes from the women's organizations at their national, provincial, and local levels, there are also nine provincial CAC branches and local CAC branches in many of the larger towns and cities. These have been set up to coordinate the efforts of individual members and local women's groups.

By its constitution, the National Board of Directors of CAC must include among others representatives from a minimum of fifteen of the supporting national women's organizations. The following are represented on the 1952-53 National Board: Canadian Dietetic Association, Cercle des Fermières, Canadian Federation of Business and Professional Women's Clubs, Canadian Home Economics Association, Dominion Woman's Association Council (United Church of Canada), Federation Nationale St. Jean-Baptiste, Federated Women's Institutes of Canada, Hadassah Organization of Canada, Imperial Order Daughters of the Empire, National Council of Jewish Women of Canada, National Council Y.W.C.A., National Council of Women, Salvation Army, Ukrainian Women's Association of Canada, and Women's Missionary Society (United Church of Canada).

The combined membership reflected in the above fifteen national women's organizations alone is in excess of 500,000 women.

CAC's only paid members are a staff of two at its national head office in Ottawa. These are assisted by a large local group of voluntary workers.

National Standing and Special Committees are appointed each year. To these are referred the numerous inquiries, problems, complaints, and resolutions which are received from individual members and women's groups. These committees investigate problems and compile facts, sift and coordinate reports and replies to questionnaires, and recommend appropriate action. Many technical problems and questions are referred for information and advice to the National Research Council or to various departments of Government or associations representing trade and industry.

National CAC officers and Committee Chairmen hold round-table conferences with producer, trade, and industrial associations to discuss problems of mutual concern. Close contact is also kept with the various departments of Federal and Provincial Governments which are responsible for laws and regulations concerning consumer goods.

CAC press releases, articles for magazines, trade journals, radio broadcasts, consumer schools, and speakers' panels are other media used to disseminate information to consumers. Perhaps one of the most important services CAC performs is the publishing of its *CAC Bulletins.* These are issued ten times a year. The present mailing list is 17,500 copies per issue. They are mailed to individual paid-up members and the CAC liaison officers of women's groups at the national, provincial, and local levels.

At the present time, CAC has only two sources of income: (1) fees — a fifty-cent annual fee from individual members, half of which is retained by the provincial and local CAC branches, plus a $10.00 annual contribution from participating national organizations and a $5.00 special group membership from rural women's groups — and (2) a grant-in-aid from Parliament. In its formative stages, CAC sought financial aid from the Government and was granted assistance for a three-year period from funds allocated to the Consumer Branch of the Wartime Prices and Trade Board. Two years ago, Parliament included CAC with other national voluntary organizations such as the Boy Scouts Association, the Girl Guides, The Health League, V.O.N., and others to receive a grant-in-aid. The first year this grant was $7,000. This year it was $6,000.

While CAC hopes to receive such a grant from Parliament as long as necessary, it has just voted to increase its individual membership fee from fifty cents to $1.00 per year. With its growing membership, this should soon make the Association entirely self-supporting.

Accomplishments of the CAC

1. *Weight on Packaged Goods*

Success crowned a two-year effort by CAC to have the net weight of contents printed on all soap flakes, powder, and detergent cartons. CAC showed the Government Department of Weights and Measures that the size of boxes was no indication of the amount they contained. As a result, Parliament passed a Bill in 1951 making it compulsory for all manufacturers of packaged goods to print on the carton the weight of the contents when packed. This Bill was implemented in the fall of 1952. Already, fast-moving lines have begun to appear with the weight so marked. It is anticipated that in the near future all unmarked packages will have disappeared.

2. *Margarine*

One of CAC's early accomplishments was to appeal the Dominion Government's ban on margarine which had existed in Canada for many years. CAC did so on purely constitutional grounds, maintaining that the Dominion ban contravened the British North America Act. One of the CAC Board of Directors, a prominent woman Q.C., volunteered

to take the case to the Supreme Court of Canada on behalf of CAC. She won her case. The federal ban was declared "ultra vires", and the Privy Council sustained this decision when the Supreme Court's decision was appealed. Thus the control of margarine was handed back to the provinces where it rightfully belonged. Today eight out of the ten provinces allow its manufacture.

3. *New Bread and Flour Regulations*

In May 1952, the Food and Drug Division of the Department of National Health and Welfare called a meeting of the millers, bakers, and allied trades, and representatives of the Canadian Association of Consumers to consider recommendations for new bread and flour regulations. These regulations came into effect January 1st, 1953, and contain among other provisions the four main proposals from CAC: (1) that "Enriched" bread shall contain a specified amount of milk or milk solids; (2) that a standard be established for whole wheat bread, containing not less than 60% whole wheat flour, and that the percentage be so stated on the label; (3) that brown bread shall bear on its label information as to whether or not it has been coloured by means of whole wheat flour, graham flour, bran, molasses, caramel, or a combination of these and as to whether it contains whole wheat flour and if so, what percentage has been used; and (4) that provision for the continuation of Canada Approved flour and Canada Approved bread shall be retained in the Act.

4. *Indirect Taxation*

CAC strongly opposed the proposal of the Dominion Government to amend the British North America Act to permit Provincial Governments to enter the indirect tax field. CAC believed that in the interests of good democratic government and good citizenship, taxpayers should be conscious of the fact they are paying taxes, and that Provincial Governments should not be allowed to enter the indirect or "hidden" tax field. Quebec CAC, in particular, played an influential part in the decision of the Quebec Government not to ask for this amendment. Since all provinces had to agree before a change could be made in the B.N.A. Act, the negative decision of the Quebec Government made the proposed amendment impossible and the matter was dropped.

5. *National Industrial Design Committee*

At the invitation of the National Industrial Design Committee, CAC has appointed a consumer representative to this body. In cooperation with this Committee, CAC published a booklet entitled *It Pays to Buy Articles of Good Design.* This was distributed to all individual members and women's organizations. Through this booklet, films, and discussions, CAC is encouraging consumers to know and buy only well-designed articles. Suggestions and "beefs" about the design of consumer articles which are received by CAC are "screened", indexed, and forwarded to

the National Industrial Design Committee. Those which have merit are forwarded in turn by the Committee to the various manufacturing associations for their information and guidance in designing future consumer products.

6. *Resale Price Maintenance*

When it presented its brief in 1949 to the Royal Commission on Prices, CAC asked the Commission to investigate the matter of resale price maintenance. Subsequently, and in accordance with its basic principles, it opposed the principle of resale price maintenance in a brief presented to the McQuarrie Commission on Combines. In 1951, CAC presented a further brief to the Parliamentary Committee on Combines Legislation, supporting the proposal to outlaw this practice. In 1952, Parliament passed legislation banning resale price maintenance in Canada.

Things CAC Has Not Done

The Canadian Association of Consumers has not supported demands for "rolling back prices", for granting subsidies, for prohibiting some imports, for banning certain exports, or for higher taxes on "profits". CAC has not asked for either selective or over-all price control.

Despite pressure from many groups, organizations, and individuals asking it to support these things, CAC has taken the stand that, before making demands of Government or of any sector of our economy to take specific steps to control prices, every responsible group or organization must study and strive to understand some of the basic causes of high costs and inflation in case the very action demanded would precipitate or worsen the situation.

CAC reached the conclusion that over-all price control does not seem to be the right answer for *curing* inflation; it merely conceals the causes and only for a time; it deals only with the symptom — high prices.

However, CAC has reaffirmed at its last two annual meetings the policy previously adopted, that, should circumstances make it necessary to establish price controls, CAC would support them, but would ask that such controls include controls on the major ingredients of prices, including wages and salaries.

Some Things for Which CAC Is Workiing

CAC has been given credit for the National Trade Mark and True Labelling Act which was passed by Parliament three years ago. While the Act has not yet been implemented, progress has been made recently. As a result of CAC efforts, the Minister of Trade and Commerce asked the Government Specifications Board of the National Research Council to call a meeting of representatives of garment manufacturers, retailers,

the Standards Division, technical experts, and the Canadian Association of Consumers to consider plans for developing standardized sizings for women's and children's clothing. This meeting was held in November, 1952, and from it a committee has been established to carry out this programme.

The development of informative labelling of textiles, particularly the many new fabrics now appearing on the market, to show the major fibre content of materials, which would in turn help consumers know how to use and care for them, has been undertaken.

Consumer representation on Government Milk Boards in each Province is being attempted. (In Ontario, CAC succeeded in having a consumer representative appointed to the Ontario Milk Board.) A price differential between home-delivered and store-purchased milk is another objective. (In Manitoba, CAC secured an amendment to Provincial legislation so that the Milk Control Board may set the minimum and maximum prices of milk. As a result, milk sold in stores in Winnipeg is now cheaper than home-delivered milk.) Finally, CAC is trying to further public hearings by Milk Boards before changes are made in the price of milk. (In Manitoba and Ontario, CAC has secured a ruling that Milk Control Boards must hold public hearings before altering the price of milk.)

CAC also supports a distinguishing label on canned fruits and vegetables to indicate if they have been packed in a Federally inspected plant, as well as the use of more uniform terms in grading the quality of foods to eliminate the present confusion of consumers caused by the variety of terms now used to denote quality: for example, "Red" beef, grade "A" eggs, "fancy" canned fruits and vegetables, etc.

The work the Canadian Association of Consumers has done and is doing is not spectacular; educational work rarely is. However, its progress in the five years of its existence may be measured by the extent to which Government and industry alike are now *accepting* CAC as the official representative of Canadian consumers and *turning* to it to ascertain consumer opinion, and through it, channeling information concerning many aspects of the complex price and supply problem.

Through CAC, the consumer movement is firmly established in Canada. If it is sound in its basic principle, that an enlightened consumer opinion is of as great importance as any other single factor in maintaining the economic stability of this country, CAC can and will continue to play an ever-expanding part in this great movement.

Control Over Reports

J. M. White

Present business and industrial practice involves an increasing amount of specialization, which in turn implies a great need for coordination at various levels and efficient exchange of information among those in different divisions of individual firms. Professor James M. White, of the Mechanical Engineering Department, McGill University, takes time out to review the ways in which reports can contribute effectively towards these ends and to discuss various methods by which such reports may be controlled.

MODERN industrial concerns, to a large extent, are so large and complex that they require a large amount of "paper work" in their administration. There may be many complaints on this score but it is difficult to see how any concern could continue operations without using the medium of written records to some extent. This requires a system for collecting data and presenting information to management and others. The presentation of information is accomplished through the medium of reports, statements, manuals, directives, etc. In presenting information, data must be classified and summarized for the purpose of clarity. This information must be analyzed and interpreted by the user to give it meaning, although some analysis is possible in the process of presenting it.

One should never lose sight of the fact that reports are a means to an end and are not an end in themselves. There is no better way for a department to become ineffective than to spend most of its time and effort turning out great volumes of paper work of doubtful value, losing sight of its true function in the process. There is also a tendency for each unit to work independently of other units resulting in some cases in duplication of effort, contradictory data, and a generally large and costly amount of paper work. The problem of controlling the compilation and dissemination of information is important enough in many cases to warrant the creation of a centralized agency for this purpose.

Although this may well be done on a company-wide basis, it may be done profitably on a departmental basis in those cases where the volume of paper work is large. This is often true of the manufacturing department, and this paper deals largely with the controlling of reports in that department. Control over reports originating in the manufacturing department could be assigned to some one in the department as a full-time or part-time duty and this person will be referred to hereafter as the report coordinator, or simply as the coordinator.

Requirements of Satisfactory Reports

Reports for executives must not only present enough information to give a complete picture of the results of operations and sufficiently accurate that they can be relied on to give a true picture, but must also be presented in such a manner that they can be easily understood. Reports usually summarize and classify a great mass of data in such a way that the essential facts can be quickly grasped. In preparing reports, it is necessary to keep in mind the purpose of preparing the information and the person or persons who will be most interested in the report. The form in which financial statements are presented to bankers, directors, and executives would probably be ill-suited for employees or the general public. Similarly, reports prepared for high-level executives would be quite different in form and content from those furnished to lower-level executives. In general, the lower the level of authority of an executive receiving a report, the more restricted should be the scope of the report and the more detailed, the content.

The requirements for satisfactory reports have been summarized as follows by Mr. McKinsey:

"1. They should be sufficiently simple to be easily understood by those for whose use they are intended . . .

2. They should be sufficiently comprehensive to present a complete picture or tell a complete story . . .

3. They should be properly organized so that the subject matter will appear in logical order . . .

4. They should be arranged so that the subsidiary reports containing details can be easily tied into the major reports containing summarized data. This can often be accomplished by having the totals which appear on the detailed reports comprise the individual items which appear on the condensed reports . . .

5. They should show comparisons with standards . . .

6. They should show tendencies . . .

7. They should be stated in comparable terms . . .
8. They should be constructed so as to reflect the organization of the business. Responsibility (authority) must be delegated in the present-day type of business organization and information must be made available for holding accountable those to whom responsibility has been delegated. To accomplish this, reports must present information in such form that it will be possible to enforce accountability . . ."[1]

To this list of requirements could be added that of timeliness. Where time is important, reports should be prepared as soon as possible after the events or conditions reported on have occurred.

Classification of Reports

There are many possible ways in which reports may be classified but only two will be discussed here. It is helpful to classify reports according to the basic managerial process involved, namely planning, organizing, policy making, controlling, directing, and coordinating. A further discussion of reports under these headings follows. For the purposes of the coordinator, classifying reports by manpower, quality, schedules, facilities, material, and performance may be more useful. Most reports should logically fall under at least one of these headings, and where this is not the case, the value of such a report is suspect. Early in the program, it will be necessary to make a decision as to what kinds of reports are going to come under the jurisdiction of the coordinator. For example, it may be decided that he will only be concerned with reports that are prepared at regular periodic intervals by the various units of the manufacturing department and are distributed to others outside of the originating unit. The remainder of this paper is based on the assumption that the decision made follows the example given above.

Planning

Two common types of planning reports are those dealing with the formulation of plans and follow-up reports relating performance to plans. Often the two can be combined on one report as, for example, in the case where charts or graphs showing predictions of operations also show actual performance. Such a chart is maintained by plotting performance on the original estimates and preparing duplicates of this chart for periodic distribution. The coordinator would not ordinarily be concerned with the first type because such reports are only prepared once with infrequent revisions. Follow-up planning reports are usually

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[1] James O. McKinsey, *Managerial Accounting*. Chicago University Press, Chicago, 1924. p. 194.

prepared at frequent intervals and have a wide circulation, and the coordinator should exercise some control over them. This also applies to combined reports which are distributed to others besides the originator.

Organizing

Reports dealing with this subject usually take the form of charts and departmental write-ups. Practice varies widely as to form, responsibility for preparing, and provisions for keeping the information current. A desirable practice is to have each department do its own work, with each unit within the department preparing its individual charts and write-ups with reviews at periodic intervals. In the absence of a company-wide organization planning unit, typical duties that may be assigned to a report coordinator are the determination of the frequency of revision and the standardization of such things as terminology, form, and content.

Policy Making

Policies at the sub-departmental level are usually called standard practices or standard instructions. These are issued from time to time and are collected in manuals. They probably would not come under the jurisdiction of the coordinator.

Controlling

In this discussion, control reports are considered to be those reports which are an aid in controlling routine operations. Reports do not control operations in themselves. Control reports furnish information which may be used to judge how effective control procedures are and to indicate when action should be taken to maintain control. It is important to be certain that they do not provide misleading pictures. A statistical quality control chart is an ideal form for this purpose in those situations where it can be used. The principal advantages of this form of report are: (1) better visualization so that a picture of the condition reported on may be easily grasped; and (2) a practical method of determining whether performance was normal or abnormal which results in a better utilizaton of the exception principle of management.

It frequently happens that when a control procedure is instituted on some particular phase of operations, a slow gradual improvement is obtained up to a certain point where performance levels off and remains relatively constant except for a certain amount of unavoidable fluctuation from one period to the next. Improvements beyond this point usually cost more than they are worth, although this should not be taken for granted. The emphasis in the beginning is on making an improve-

ment rapidly. In this phase, there may be more reports dealing with various control factors, and they may be prepared more often. In the second stage, the emphasis should be changed to maintaining control with a minimum of effort. It is often possible to accomplish this by using some over-all measure as a control factor. Reports should be presented at more infrequent intervals as long as operations are under control. If trouble develops, closer attention should be paid until operations again return to a state of control.

Directing

The majority of reports coming under this classification would consist of orders and instructions and returns dealing mainly with the status and progress of orders. Some orders and instructions are routine as in the case of production orders issued monthly for the same product. These reports are few in number, they have become well standardized through long usage, and their distribution is limited. It is doubtful that the coordinator would be concerned with them. Reports showing the progress and status of work are a different matter. They can be prepared as special reports asked for only infrequently or they may be published periodically so that a continuous picture of operations is obtained. In the latter case, frequently met in practice, they tend to have a wide distribution so that they are an important type of report with which the coordinator is concerned. Reports dealing with the follow-up of planning are very similar and would be treated in the same manner.

Coordinating

For the most part, reports dealing with coordination are restricted to showing interrelated schedules for various functions and progress in meeting schedules. It is very difficult to evaluate coordination on an objective basis, and it is usually assumed that if the various functions meet their schedules, the work will proceed smoothly and with no hold-ups. This would be true if the time lag between schedules could be made large enough, but if schedules are tight and it is important to reduce the over-all cycle time to some minimum value, activities will overlap, and the problem of coordination becomes important. Techniques and reports for accomplishing this have not been developed to any large extent.

The Report Coordinator's Job

Some idea of the work involved in controlling reports is obtained by considering the responsibility and duties of the coordinator. The following outline is intended to be indicative of the work and is not necessarily the best pattern to follow in all cases. The work probably would not keep one man fully occupied in the average company, and the person who is given this job would likely have additional duties of

a similar nature. It is apparent that he should rank pretty highly in the hierarchy of management in the Manufacturing Department, probably reporting directly to the Vice President of Manufacturing.

The function of report coordination is to analyse reporting as practiced in the Manufacturing Department, set up procedures for controlling those reports defined as coming under the jurisdiction of the coordinator, and in general advise and make recommendations for improving reporting. This insures that no report is circulated that does not serve a useful purpose, that duplication of information is reduced to the lowest possible level, that adequate and accurate information is presented to all who require it, and that the information is presented within a reasonable time and in the most usable form for the purpose of the person receiving it. The report coordinator is responsible for achieving these goals to the greatest possible degree.

Duties of the Report Coordinator

1. Examine the form of reports to determine such things as ease of preparation, clarity, identification of report, circulation, etc., and make recommendations for changes in forms where desirable.
2. Standardize such things as size, headings, miscellaneous information to be shown on reports, terminology, etc.
3. Keep a record of reports and their contents.
4. Set up procedures that will result in maintaining control over the issuance of reports.
5. Determine that persons receiving reports do not receive useless, redundant, or conflicting information.
6. Keep a close watch on independent and informal record-keeping and attempt to reduce this to a minimum.
7. Make recommendations for the addition of new reports where present coverage is inadequate.
8. Solicit comments on reporting from the users and educate them to obtain the greatest possible benefits from reports.
9. Determine whether or not executives are receiving adequate information, at the proper time, and in the best form for their purposes.
10. Try to resolve arguments as to who should publish reports in those cases where the same or similar information comes from different sources.

Conclusions

Control over reporting is a subject which deserves some careful consideration. In addition to providing the more obvious benefits which have been discussed briefly in this paper, such a programme could throw some light on related management problems. For example, it might surprise some managements to discover the extent to which factors that have an important bearing on operations are ignored, the concepts that some executives have of their responsibilities, and the abundance of information available to some management levels and the almost total lack of it at other levels. A programme of controlling reporting is by its very nature a long-term project; changes should be made slowly. A continuing effort needs to be applied in a systematic manner. Results will be slow in appearing, and there will be many obstacles to overcome. However, when the programme starts to succeed in its objectives, the return to management will be greatly in excess of its cost.

Magazine Readership Studies

Duncan MacInnes

In this article, another in our series dealing with various advertising media, Mr. MacInnes, Manager of the Media Department, McCann, Erickson, Inc., discusses the various ways in which Canadian magazines obtain facts about their readership in relation to advertising.

CONSUMER magazines have long been prime movers in the demand for marketing research. It has been widely used in all departments. Editors use it to determine the likes and dislikes of readers; circulation managers, to establish sales potentials; and advertising managers, to obtain facts useful to advertisers and advertising agencies in evaluating magazines as an advertising medium. Without marketing research, the present development of magazines in this country would have been much slower, if not impossible.

Inasmuch as editorial and circulation research is primarily for internal use, this review will deal only with the Canadian magazines' search for facts in relation to advertising.

Basic Information

Some of the studies issued by magazines are founded on basic data and may not be regarded as "research" in the accepted sense today, unless we accept as a definition of research: "The laborious and continued search after truth". For example, thirteen national magazines compile and issue a quarterly cumulative report on advertising linage and dollar volume by accounts, known as the *Canadian Magazine Advertising Summary.* Linage figures are keyed to show whether color was used, "bleed" copy, etc.

Several analyses are made of this material, such as the preparation of lists of advertisers in order of their total investment in magazine advertising and the examination of trends in advertising by major industry classifications and place of origin of advertising. This data is extremely valuable to magazines, advertising agencies, and advertisers in that it shows the relative position of magazines and spending by competitive companies. Knowledge of competitors' plans is important to successful selling.

The most important basic information is that provided by the Audit Bureau of Circulations, of which Canadian magazines were early members. From these reports the user of magazine advertising space can obtain reliable facts showing how many copies of each issue were sold, by what means they were sold, how much the reader paid, etc. He can obtain the geographical distribution of circulation by provinces and city size. Most magazine publishers provide once a year a more complete breakdown of circulation, showing number of copies sold by counties, and all cities, towns, and villages of 500 population and over. These lists are prepared on a special form provided by the Audit Bureau of Circulations.

Many advertisers demand as first evidence of acceptability that a publication be a member of the A.B.C. It would, in fact, be difficult to do business without this first cooperative validated research.

It is no criticism of the A.B.C. to say that it leaves unanswered certain questions in the minds of buyers of advertising, and, as marketing methods improved and media competition increased, it soon became evident that the mere count of circulation was not enough. The medium and the advertiser wanted to know more. Quantitative measurement of magazine circulation does not provide evidence of the impact or influence of a magazine, nor does it fully determine its value as an advertising medium. Thus it became important to know some of the attributes of magazine readers. Are they qualities important to advertisers? Where and how do magazine readers live? How do they differ from non-magazine readers?

The Introduction of Readership Studies

So began the present era in magazine research in Canada, which has resulted in the production of scores of research projects. About twenty years ago they took the form of mail questionnaires, usually sent out to subscribers selected at random from mailing lists, asking such simple questions as: "What magazines do you read? What do you read in them? How many people read your copy?"

Then came readership studies, item-by-item surveys of magazines to show the popularity of various features. These studies produced reasonably accurate and very useful reader ratings of editorial features and advertisements.

There was nothing particularly new about this type of magazine research. Walter Dill Scott had made studies in the early 1900's of magazine reading habits and of the attention value of the relative size of magazine advertisements. It is interesting to note that at the time he "offended" the science of psychology in applying its principles to advertising.

While useful, these early surveys still left unanswered some of the most pertinent questions being asked about the magazine market. For

example, while it was commonly believed that an average copy of a magazine is read by several people during its lifetime, little had been done to establish this fact.

Audience Measurement

Meanwhile, a continuing study was started in the United States in 1938 by *Life* magazine to establish the size and character of the magazine "audience". Interviews were made with a cross-section of the population, rather than with the subscribers of the magazines, and from these surveys a figure was obtained which was projected over the total population of the country to determine total number of readers.

The first studies of this nature were made in Canada in 1945 and 1946 by Maclean-Hunter Publishing Co. Ltd. About six thousand interviews were made to determine the audience of three general and two women's magazines. The reports show total audience and distribution of readers by regions, community size, age groups, economic levels, sex, and occupations. These surveys were based on the principles developed for measurement of magazine audiences in the United States and provided for the first time in Canada an accurate indication of the characteristics and size of the magazine market.

The CARF Study of 1949

Out of these pioneering research projects came the *Audience Study of 11 Magazines in Canada* of 1949, conducted on behalf of The Canadian Advertising Research Foundation by The Advertising Research Foundation, New York. This study included the following magazines: *Canadian Home Journal, Chatelaine, La Revue Moderne, La Revue Populaire, Le Samedi, Maclean's Magazine, National Home Monthly, New Liberty, Reader's Digest, Selections du Reader's Digest,* and *Time* (Canadian Edition).

This research project was said to be the largest "validated" research project ever undertaken up to that time. Purpose and scope of the survey, as set forth in the report, was:

"To provide authenticated information about the readers of 11 of the leading magazines circulating and selling advertising in Canada.

"The report is designed to give advertisers, advertising agencies, and publishers as complete a picture as possible of the audiences of the surveyed magazines.

"The study provides data on the total number of persons 15 years of age and older who read each surveyed magazine. It gives audience breakdowns for each magazine by localities and classes of readers.

It reports on the characteristics and possessions of the readers of each magazine and supplies similar information on the non-readers of the surveyed magazines.

"In addition, the study provides information on the audience duplication among various publications."

The Technical Committee of the Advertising Research Foundation developed the sample and specified that the "known-probability" principle be used. This was one of the pioneering efforts in commercial market research to achieve a truly scientific population sample with known limits of error. The sample was designed to represent Canada's entire urban and rural population fifteen years of age and over. A very small percentage of the total population was, for practical survey reasons, excluded from the survey and except for these, everyone had some likelihood of being selected for interviewing. The likelihood or degree of probability was mathematically determined.

A reader was taken to be a person fifteen years of age and over who proved that he or she had read or looked into at least one of the ten selected editorial items in an issue of a magazine. Care was taken to eliminate from the survey the influence of items not exclusive to the issue. This covered items appearing elsewhere than in the issue and also applied to items recurring in similar form in succeeding issues of the same magazine. This eliminated many of the most popular features of these magazines from the reading tests.

Great care was taken also to prevent people from claiming to be readers of magazines into which they had not even looked, which is accepted as one of the chief interviewing problems in surveys of this nature. Consequently, whereas seventy-two per cent of the people claimed to have read one or more of the eleven magazines in this survey, only forty-six per cent qualified as proven readers. The combined audience of 4,190,000 therefore represented the total unduplicated audience which an advertiser would have the opportunity to reach with an advertisement in each of these eleven magazines.

The *Audience Study* was well received by advertisers and advertising agencies and performed valuable service in supplying accurate information about the quality and size of the magazine audience. By 1951, however, many requests were being received to bring the study up to date as it was felt that substantial changes had taken place in the magazine audience as a result of circulation increases and improvement in the medium.

The Second Audience Study

In May, 1952, it was decided that another study be made, but that this time it be extended to include four week-end publications, *The Star Weekly, Weekend,* and the rotogravure sections of *La Presse* and *La Patrie.*

Canadian Homes and Gardens was included among the magazines and replaced *National Home Monthly,* which suspended publication in 1951.

Basically, the 1952 *Audience Study* used practically the same questionnaire as that designed for the 1949 study. The territory covered was extended to include St. John's, Newfoundland.

Some interesting comparisons are provided by the two studies. One of the most interesting is the substantial increase in audience despite the fact that aggregate circulation shows only little increase.[1] Figures are:

	Aggregate Circulation	*Total Audience*
1949	2,786,203	4,190,000
1952	2,821,842	4,650,000

Other comparisons between the two studies are:

ELEVEN MAGAZINES IN COMBINATION REACH . . .

1949	*1952*	
46%	49%	of all the people, 15 years and older.
42	45	of the men.
49	52	of the women.
49	52	of the people 15-29 years.
47	52	of the people 30-44 years.
42	44	of the people 45 years and over.
45	47	of the people in the Maritimes.
38	49	of the people in Quebec.
48	49	of the people in Ontario.
50	49	of the people in Prairie Provinces.
50	49	of the people in British Columbia.
55	56	of the people in places over 100,000.
49	53	of the people in places 1,000-100,000.
38	37	of the people in places under 1,000 and rural.
51	55	of the people who live in urban homes.
45	43	of the people who live in rural non-farm homes.
33	31	of the people who live on farms.
73	75	of the people who claim some university education or better.
60	62	of the people who claim high school or technical school (but no university).
32	36	of the people who claim grade school education or less.
67	73	of the people in the "A" economic level.

[1]The circulation of *National Home Monthly,* included in the 1949 Study, was 340,819 While the ten magazines included in both studies had a circulation gain of about 300,000 in the period between the studies, total audience increased 460,000, which was at variance with the belief that "pass-along" or secondary circulation of these magazines would decline with increasing circulation.

58	64	of the people in the "B" economic level.
44	49	of the people in the "C" economic level.
27	29	of the people in the "D" economic level.
61	68	of the people in the professional, administrative, managerial group.
59	69	of the people in the sales, clerical group.
49	51	of the people in the technical, skilled group.
40	41	of the people in the unskilled and service workers group.
31	32	of the people in the farm group.
43	42	of the people in the temporary, part-time, unemployed and retired group.
44	47	of the people who live in owned homes.
53	56	of the people who live in homes having a telephone.
48	51	of the people who live in homes having electricity
55	56	of the people who live in homes piped for gas.
59	57	of the people who live in homes having mechanical refrigeration.
55	56	of the people who live in homes having a gas stove.
57	57	of the people who live in homes having an electric stove.
48	52	of the people who live in homes having a car.

It will be seen that the most substantial changes between the two surveys have taken place in the percentage of people reached in higher income brackets and those holding more important positions which is an important part of the magazine story.

Other Audience Surveys

The development of audience studies has not meant the discontinuance of other research by magazines. Apart from more than $60,000 invested in the *Audience Study* this year, magazines in Canada probably invest upwards of $100,000 a year on research.

Important among the other studies are the Starch readership studies, to which several magazines subscribe, some on behalf of both editorial and advertising departments. The Starch ratings of readership of advertisements are extensively used and provide valuable data for copy checking.

Chatelaine and *Canadian Home Journal* maintain panels of readers to whom questionnaires are submitted frequently to provide material useful to editors and advertisers. For example, *C.H.J.* surveys may take the form of questionnaires on buying intentions (home furnishings and equipment), buying habits, and brand preferences (soaps, detergents, cleansers, and wax). *Time* magazine makes frequent surveys of subscribers in Canada to secure information on reader characteristics, product preferences, vacation plans, etc. Many other surveys have been made in the past five years

to ascertain information on magazine preferences by people in various trades and professions. *Saturday Night* issued a survey a short time ago designed to show characteristics of their reading audience.

Reading Methods

One of the arguments made for magazine advertising is that it has long life, and while the *Audience Study* indicates who and where magazine readers are and how many readers there are, it does not show *how* they read their magazine. Several studies have touched on this subject, the most important being *How Magazines are Read* which was produced last year by Maclean-Hunter Publishing Co. Ltd. The main purpose of this study was to find out how many times the reader picks up a magazine in the course of reading it and, second, the procedure followed during each of these reading periods.

The original objective at the time was to determine how magazines in general are read. Preliminary tests, however, indicated that reading habits vary with the type of magazine, depending on the difference in format and editorial content. It was decided, therefore, to confine the study to *Maclean's* and *Chatelaine,* because they are similar in format. The purpose of this study, of course, was to show long life and to indicate that an advertisement has many chances of being seen.

More than fifty per cent of the respondents said they had picked them up three times or more. The average for all those interviewed was 2.8 times. The motions people go through in reading their magazine are interesting. Of the total:

69% leafed through issue noting articles and stories of interest.
12 looked up table contents and selected a story or article which appeared interesting.
10 read one particular department first (such as editorial) then leafed through issue.
5 read magazine, item by item, from front to back.
3 used other methods.
1 could not recall method of reading.

Advertisement Readership and Activation

The foregoing is a brief review of the efforts of magazines to provide basic data on the use of their medium by advertisers and their audited circulation, to define the characteristics of their audience, and to provide evidence of readership and long life. However, the ultimate purpose of advertising is to induce people to want a product and to buy it. Hence,

two questions must be answered: (1) To what extent do people read advertisements of a product? and (2) To what extent does reading cause them to want and to buy that product?[1]

Some steps have been taken by magazines in Canada to provide information on activation in studies issued recently entitled *Action Resulting from the Reading of Articles and Advertisements in Chatelaine.* In these studies a standard Starch readership interview was completed. After the completion of the readership interviews, one hundred questionnaires were selected at random from the full monthly quota, with regard to respondent attribute or previously noted readership response, and specific depth interviewing was conducted with each respondent only on those items for which, on the previous visit, she had identified herself as a reader.

The following is a summary of results in study number two:

	Percentage of All Readers Interviewed
Advertisements and Editorials	
Noted one or more	99%
Took *some* action on one or more	80%
Editorials	
Learned something from one or more	43%
Advertisements	
Have purchased or intend to purchase one or more advertised products	28%
Wanted to know price of one or more advertised products	22%
Would like to have "this kind of product" of one or more of all advertised products	68%
Would like to have "this kind of product" of one or more stove advertisements	14%
Would like to have "this kind of product" of one or more refrigerator advertisements	23%
Would like to have "this kind of product" of one or more washing machine advertisements	3%
Would like to have "one of these products" of all other product advertisements and multiple product advertisements	61%

It will be seen from this brief review that magazines in Canada have done much to provide information about their medium on which management and advertising agency executives can base intelligent decisions.

[1] Dr. Daniel Starch, *Measuring Human Behavior in Marketing.*

Book Reviews

EFFECTS OF TAXATION: DEPRECIATION ADJUSTMENTS FOR PRICE CHANGES

by E. Carey Brown. Harvard Business School, Division of Research, Boston, 1952. 161 pp. $3.25.

Depreciation and related problems of accounting for fixed assets have long been among the most-discussed areas of accounting. A bibliography of books and articles on this subject would make a sizeable volume in itself, a volume in which writings of the postwar years would loom large.

The primary reason for this great outpouring has been, of course, the rapidly rising level of prices since the end of the war. Simply stated, the problem which has received so much attention arises from the fact that the revenues of a business are largely valued in current prices. Depreciation costs are not; they are based on historic costs, and historic costs mean in most cases, lower costs. This in turn means an element of reported profit which arises solely from the difference in these two price levels.

There are, of course, many reasons for the desire of all concerned to eliminate this excess amount of reported income, or at least explain that it really isn't true. However, there are three factors which seem to be most frequently discussed: public opinion, stockholder relationships, and taxation. Public opinion involves the touchiness of businessmen to the often unfavourable reaction of the public to reports of ever-increasing corporate income. The stockholder has a natural desire to have his dividends increase in the same pace as profits. As to taxation, the problem becomes more complex, but the generally held view is that the inclusion in taxable income of this element of profit arising solely from an increase in price levels results ultimately in an impairment of the company's capital.

Professor Brown's book is devoted principally to the tax aspects of the historic-cost depreciation vs. replacement-cost depreciation problem. However, it covers the other aspects of the subject in a very thorough fashion. His conclusions are placed within the specific framework of the tax problem, but he arrives at essentially the same result as do those

studies which have examined the problem within a wider frame of reference. He concludes that when the equities of the situation are considered, it appears that owners of depreciable assets are not the only people who are adversely affected by inflation and that to use taxable-income determination to redress the balance more in favour of the owners of depreciable assets might well work to the disadvantage of other groups.

Like the majority of other writers on the subject, he faces the hurdle of determining an acceptable measure of price change. Here he gives special emphasis to the complications caused by quality improvement. This factor has too often been glossed over, I believe, in some other discussions of the problem of constructing suitable indices of the movement of fixed asset prices. Though many statisticians perhaps disagree, Professor Brown concludes that until some method of adjusting for quality improvement is devised, "it is doubtful if even approximate measures of price changes can be made."

In other words, Professor Brown has come to the same conclusion that has been reached by most accountants who have studied this problem. It is obvious that historic-cost depreciation accounting leads to some distortion in the calculation of corporate income in periods of rising prices. (One might ask here by how much this fact would possibly be offset if all of the many approximations and estimations which are typically involved in the computation of corporate income were ironed out.) In spite of this, the conclusion generally reached is that it does not at the moment seem prudent to undertake a new method of computing income which may be even less realistic than the present one.

The problem is one about which every businessman should be thinking. In spite of the fact that this book was written within the framework of United States income tax regulations it can be well-recommended to any Canadian businessman — whether he wants a clear, concise restatement of the whole problem or whether he wants to make first acquaintance with the literature on the subject.

—Dwight R. Ladd
Assistant Professor
U.W.O. School of Business Administration

CONTEMPORARY COLLECTIVE BARGAINING

by Harold W. Davey. Prentice-Hall, Inc., New York, 1951. 532 pp. $5.50.

Organized labour - management relations today have assumed a tremendous importance in the North American economy. Collective bar-

gaining, the method by which representatives of management and employees endeavour to reach an agreement concerning the basis of their employment relationship, has become an established procedure in industry not only by custom, but by legislative sanctions. This, coupled with an expanding postwar industrialization, has given impetus to the development of trade union organization, and a concomitant emphasis on labour's role in industry. Unions are now big business, and in our highly unionized economy collective bargaining sets the patterns for determining the terms and conditions of employment.

In this book the author is concerned with examining the structure of contemporary collective bargaining and some of the more important problems arising out of the current economic scene.

The book gives a very clear and useful analysis of the varieties of collective bargaining structures which exist today, the different types of bargaining units, the actual subject matter negotiated, the administration of a collective agreement, the procedures of negotiation and administration, and third party intervention in industrial disputes through mediation, arbitration, and conciliation. Although the subject matter deals with collective bargaining in the United States, and not Canada, most of the material is pertinent to the Canadian scene, with the exception of that concerned with American labour legislation.

The book cannot be classed as purely academic. The author approaches the problems of contemporary collective bargaining through a blend of theoretic and applied analysis, with major emphasis on the concrete questions of union-management relations centred at plant level.

Special consideration is also given throughout the book to what the author feels to be three problems of general significance posed by the rapid growth of collective bargaining and unionism: first, an economic problem of relating collective bargaining policies to a national objective of maintaining full employment without inflation; second, an organizational and political problem of the achievement of democracy in industrial relations when the modern tendency is towards highly centralized bargaining structures; and third, the social problem of achieving a stable industrial peace.

To any management personnel interested in the ever-changing dynamics of collective bargaining, this book presents a useful and comprehensive description of the process. It is additionally valuable in its analysis of present and projected future trends in labour-management relations and as far as the reviewer is concerned is one of the best in its field.

—I. E. Elliott
Research Associate
U.W.O. School of Business Administration

PRINCIPLES OF HUMAN RELATIONS

by Norman R. F. Maier. John Wiley and Sons, Inc., New York, 1952. 474 pp. $7.50.

The past few years have seen the development of good employee relations in business as an increasingly important function of modern management. Business organization today is faced not only with problems involving machines, materials, and industrial processes, but also with the administration of vast numbers of employees.

It is in this area of human relations in industry that Dr. Maier specializes. This book was written for those people who are interested in such problems and who are concerned with overcoming communication barriers in the industrial system, preventing misunderstandings, and developing constructive attitudes within the labour force for purposes of greater efficiency and satisfaction on the job.

Dr. Maier argues that good employee relations involves a supervision which is alert to employee attitudes and skilled in the techniques of dealing with human problems. The core of this book is directed therefore towards outlining a training program for management personnel which he feels will best develop such insight and skill.

Dr. Maier sees the problems of supervision in industry as problems of group relations rather than purely interpersonal or individual relations. He perceives the supervisor as someone who deals with a group of workers and consequently he is concerned with the techniques that can best be employed by a supervisor in dealing with such groups to attain the highest degree of cooperation and efficiency. This involves what he terms training in "democratic leadership", the democratic leader being one who attempts to get full group participation in making decisions and solving problems. The attainment of group decisions then becomes the object of good supervision.

Dr. Maier brings some rather powerful arguments to bear in showing the efficiency of such methods. He states, amongst other things, that group decision controls through *accepted* leadership rather than through force of authority; that it is a way of reconciling conflicting attitudes; that it gives each person a chance to participate in things that concern his or her work situation, and the end result is a high degree of worker morale and cooperation.

The procedure and content of the outlined training programme is designed to attain this objective. Topics of study are included first to give the trainee some basic knowledge of the psychology of human behaviour, such as democratic leadership, causation in behaviour, indi-

vidual differences in people, the nature of attitudes, frustration and its effect, morale and group structure, fatigue and boredom, and day-to-day employee contacts.

Knowledge alone, however, is insufficient. Skills of application must also be developed and can only be learned through practice. Since the trainee cannot at this stage learn these applied skills through actual experience, Dr. Maier has him engage in "role playing". This he maintains is a close approximation to a real situation. The trainee applies his learned principles of psychology by acting out a specific role in a given situation. How he handles it is analysed by himself and the class, and in this way he develops perception and skills in interviewing and dealing with people.

This method is one way of changing attitudes, which Dr. Maier maintains is a crucial process, since "all training implies people must be changed", and "a training program that does not alter people may be interesting, but it is exposure and not training".

Attempts by management to force new methods or changes on employees from the top almost inevitably meet with resistance, hostility, and apathy, which reduce the effectiveness of these new methods, no matter how "efficient" they may seem in theory. Group decision is to date regarded by the author as the most effective way of overcoming this resistance to change and of gaining cooperation and acceptance of new policies.

The book itself contains too many important new ideas to permit more than a brief outline of the main theme in this review. The reviewer would suggest, however, that it indicates the contributions to industry which are now being made by psychology as a result of research findings in the field of what is known as "group dynamics".

The training program as suggested is certainly a very advanced and ambitious type of program in comparison with the average patterns of supervisory schemes in industry. The principles and procedures outlined, however, were developed from psychological experiments and reflect the merit of having actually been applied successfully by Dr. Maier himself in leading industrial concerns in the United States. The ideas expressed, which might seem too theoretical and perhaps inapplicable, have all been tested and found to work in actual business situations, and every important point in this book is illustrated by cases taken from the author's own experience.

The objectives of democratic leadership and the training techniques for its development as outlined in this book warrant consideration by

any employer who is interested in good employee relations and is concerned with the morale, cooperation, job satisfaction, and general overall efficiency of his work force.

—I. E. Elliott
Research Associate
U.W.O. School of Business Administration

ADMINISTERING CHANGES:

A Case Study of Human Relations in a Factory

by Harriet O. Ronken and Paul R. Lawrence. Harvard Business School, Boston, 1952. 324 pp. $3.50.

The authors of this book are both members of the staff at the Harvard Business School and are associated with the human relations research group there. The basic method of research at Harvard is the gathering of first-hand information regarding concrete problems of industrial administration and organization.

This particular book is the result of a research project concerned with showing the effect on human relationships within a plant of the introduction of a technological change. It is a patient and pedestrian account of how one entire organization felt the impact in its factory of the installation of a new product — from its inception, through the various stages of development, until it was finally put into production. The company itself was a leader in the electrical manufacturing industry, which is almost by definition characterized by incessant change. It is a highly competitive industry, and the general belief prevails that the first firm to get a new product into production captures the market. In consequence, products, methods, materials, personnel, and basic orientation experience constant modification.

The authors were not concerned with the technical aspects of the changes that were introduced, but in how these changes were perceived by the people who introduced them, by the people who administered them, and by the employees who were directly affected by them. In short, they wanted to explore the human impact of these technical alterations.

By personal observation and by persistent and continuous interviewing over the period of time involved, the authors managed to build up a fairly complete picture of what was involved in terms of the behaviour of people as a result of the technical innovations.

Although such a phenomenon as is depicted by this study will never be duplicated exactly, because no two situations are alike, the systematic analysis of the human relationships in a single industrial situation may provide a useful way of thinking about the administration of change in other industrial contexts.

Change is a crucial problem in any social situation, of which industry is only one facet, since it threatens the internal stability and equilibrium (i.e. the need for well-understood, accepted relationships) of a group of people. However, it is a problem which is particularly highlighted in modern industry, where the competitive aspects depend so much on the dynamics of change.

This book addresses itself to two questions: What makes the assimilation of such changes so difficult to administer? What skill and knowledge does the executive use or need to use in order to administer changes more effectively?

In dealing with the first question, the authors, as a result of their observations, concluded that the phenomenon popularly called "resistance to change" was resistance, not to the technical aspects of the change, but "to the consequent modifications in interpersonal relationships".

They also argue that the dynamic aspect of a relationship is the character of the communication that takes place between individuals involved. "Communication is the process through which relationships develop or decline, lead to growth or frustration."

The skill of the administrator comes into play in this area of communication — which cannot be just allowed to happen. He must learn to perceive the attitudes and feelings of those with whom he must work, in order to develop team spirit and protect the stability of the functioning group against the disruptive effects of change. How he acts will affect the interpersonal relations of his work force, the effectiveness with which they will operate, and the degree to which he can obtain their utmost in cooperation.

The book is essentially a study in the obvious, but the authors' analysis of the behaviour they observed in terms of the two questions outlined above makes it exceptionally worthwhile for those interested in that particular sphere of human relations which is concerned with the effects of change.

—I. E. Elliott
Research Associate
U.W.O. School of Business Administration

HANDBOOK OF PRINTING PRODUCTION

Issued to the printing trade by E. B. Eddy Company (Fine and Specialty Papers Division), Hull, 1952.

In this book, a great paper industry sets down for the printing trade the processes of printing and almost everything that pertains to those processes. It begins at the very bottom and is not above dealing with the obvious, such as "M is the Roman figure for 1000", a fact which has been rather widely recognized over several centuries.

However, the book does not belong to the kindergarten of printing, but assails with vigour and clarity the great problems and the fine problems that belong to the art. Included are discussions of printing processes, selection of papers, calculations to show how many pages of a given size can be printed from a thousand varied sizes of paper, paper testing, standard sizes and types of envelopes, processes in manufacturing paper, preparing copy and layout, sizes of type — the anatomy of type, typesetting, an index of type families with numerous alphabets of various sizes for purposes of comparison and study, methods of lining up the type pages so that the printed sheet comes out a book or a section of a book, and proofreading. Additional sections deal with the use of space, preparing art reproductions, steps in the use of photoengraving, Ben Day screens, electrotyping and stereotyping, the secrets of colour printing, bindings, glossary of printing (a dictionary of the art), trade customs of the printing business, and specimen pages of Eddy papers.

The above abbreviated table of contents shows plainly that the *Handbook* is really an encyclopaedia of the art. It is a bible for the practical printer and has an answer for every problem that is likely to arise in his day-to-day work. The whole tale is ably written and very clearly set out, and I know of no work of this kind that approaches it in value. In the main it is printed by letterpress, but contains ten pages of offset lithography. It is printed on Wellington offset. Types used are various — Bodoni book, Scotch Roman, Garamond, Baskerville, Caslon Old Style, Franklin Gothic, and Futura Bold.[1] Part of the book is printed in monotype, and part, in linotype. The book is bound with ring binders and opens flat at every page, and should endure the long life and constant use which it deserves. The typography is pleasing, efficient, and attractive. It will bring a wealth of knowledge to the young printer, and the old printer will find in it innumerable aids.

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[1]Claude Garamond was the first man to make typemaking his business. Before then typemaking had been a subsidiary of the printing business. Baskerville was the first English printer of note, and Caslon was the first great English type cutter. The latter began his work 230 years ago, and the famous type face which bears his name is still very popular.

This 1952 issue is a second edition and is itself an excellent example of typographic originality and excellence; it is a real experience merely to turn the pages.

I regret that the *Handbook* lacks any credit to the man who prepared it. In addition, the man who designed it is not named, although I think I can detect in the pages the hand of one who is well known in Canadian typographic circles. I should like to have seen his name in it, and the names of others responsible for building the book, for it is going to become a landmark in the history of the press in this country. It has no blanks and has accomplished fully what it set out to do. It should be on the desk of every progressive printer in Canada, for it is of real value.

The *Handbook* is not the first excursion of the Eddy Company into the realm of fine typography. I have by me as I write their *Portfolio of the Work of the Great Master Printers,* issued a few years ago, which has facsimile pages from the great printers from Gutenberg to William Morris and Bruce Rogers. It is a glorious piece of work and, in its own way, a history of the march of typographic art.

—Louis Blake Duff

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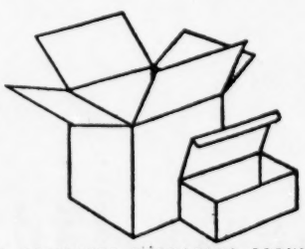

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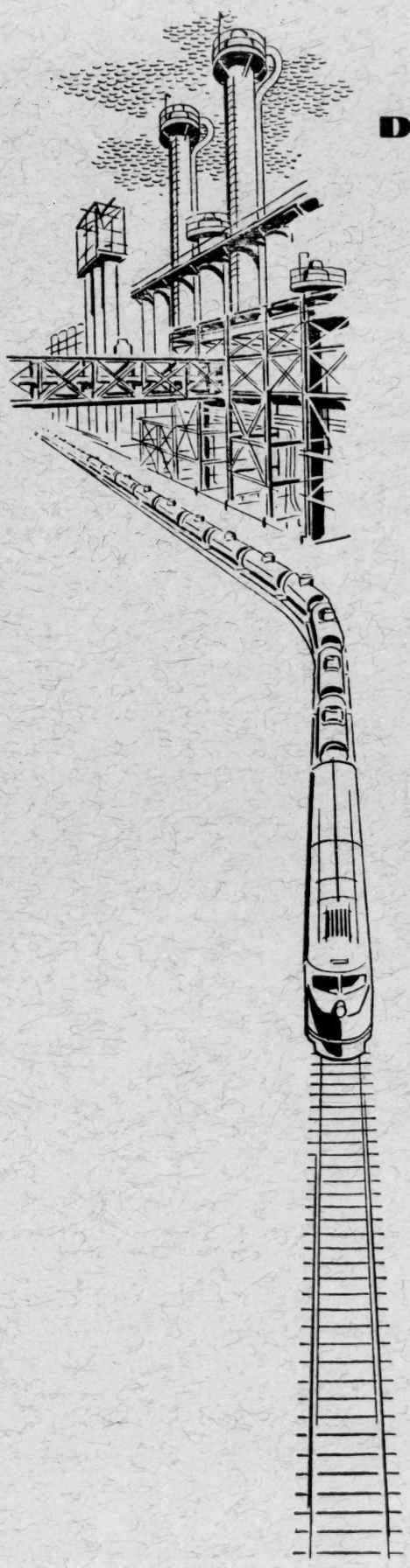

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